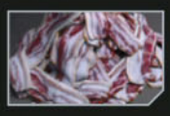


HOUDINI 14
Our definitive review of SideFX Software's exciting new offering

**8GB OF FREE ASSETS EQUIVALENT TO 12 DISCS**

www.3DArtistonline.com

78

# 3DArtist™

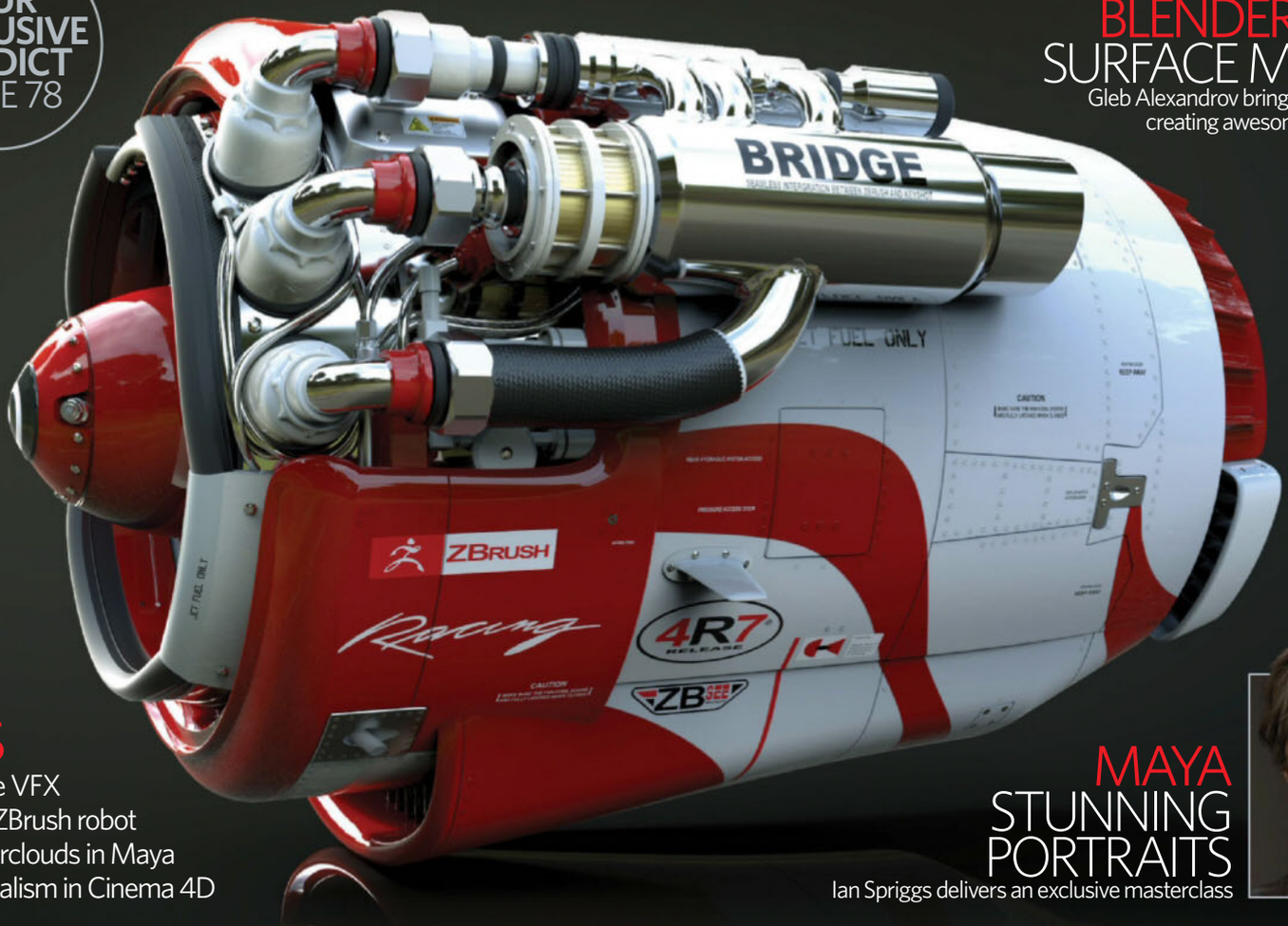
Practical inspiration for the 3D community

## DRIVING THE 64-BIT REVOLUTION

# ZBRUSH 4R7

New features revealed | Beta testers interviewed | CG professional review

OUR EXCLUSIVE VERDICT PAGE 78




## BLENDER HARD SURFACE MODELS

Gleb Alexandrov brings you 17 steps for creating awesome environments

## PLUS

- Chappie VFX
- Build a ZBrush robot
- Thunderclouds in Maya
- Photorealism in Cinema 4D

## MAYA STUNNING PORTRAITS

Ian Spriggs delivers an exclusive masterclass

**12 DISCS' WORTH OF CONTENT**

3+ HOURS OF ZBRUSH VIDEOS
HITFILM 3 PRO DEMO VERSION
MODELS WORTH OVER $200

ip IMAGINE PUBLISHING
DigitalEdition
GreatDigitalMags.com
ISSUE 078

# THE ULTIMATE WORKSTATION EXPERIENCE FOR REAL-TIME 4K

## TAKE YOUR PROJECTS FURTHER, FASTER BY ADDING BEST-IN-CLASS GPU COMPUTE TO YOUR WORKSTATION[1]

Designed for the most demanding workflows the AMD FirePro™ W8100 graphics card packs up to 4.2 TFLOPS of compute power to accelerate your projects beyond just graphics. Powered by OpenCL™, Video and Design professionals can work with multiple graphics- and compute-intense applications across up to four 4K displays[2].

- 2560 Stream processors (44 CUs)
- 8GB GDDR5 memory (320 GB/s)
- 4.2 TFLOPS peak single precision
- 2.1 TFLOPS peak double precision
- Designed to support OpenCL 2.0[3]
- 4 DisplayPort 1.2 outputs for 4K support

*For more information visit*

***www.fireprographics.com/ultra***

**Now available at selected partners:**

**SCAN computers**
Scan Computers
www.scan.co.uk
0871 472 4787

**Workstation Specialists**
Workstation Specialists
www.workstationspecialist.com
0800 180 4801

**ARMARI**
Amari
www.armari.com
0192 322 5550

© Copyright 2014 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, FirePro, and combinations thereof are trademarks of Advanced Micro Devices, Inc. OpenCL and the OpenCL logo are trademarks of Apple Inc. used by permission by Khronos. Other names are for informational purposes only and may be trademarks of their respective owners. 1 AMD FirePro™ W8100 delivers 4.2 TFLOPS peak single-precision floating point performance, while the closest competing solution from Nvidia (as of June 2014) is the Quadro K5000 which offers only 2.15 TFLOPS. Visit http://www.nvidia.com/content/PDF/line_card/6660-nv-prographicssolutions-linecard-july13-final-lr.pdf for Nvidia product specs. FP-93 2 AMD FirePro™ W8100 features 8GB memory. Nvidia's competing card in the market as of June 2014 is the Quadro K5000 with 4GB memory. Visit http://www.nvidia.com/content/PDF/line_card/6660-nv-prographicssolutions-linecard-july13-final-lr.pdf for Nvidia product specs. FP-94 3 Support for OpenCL 1.2 enabled today; conformance expected. AMD plans to release OpenCL 2.0 drivers for AMD FirePro™ professional graphics cards in Q4 2014; conformance testing will be completed at that time. Images courtesy of © Uli Staiger - www.dielichtgestalten.de

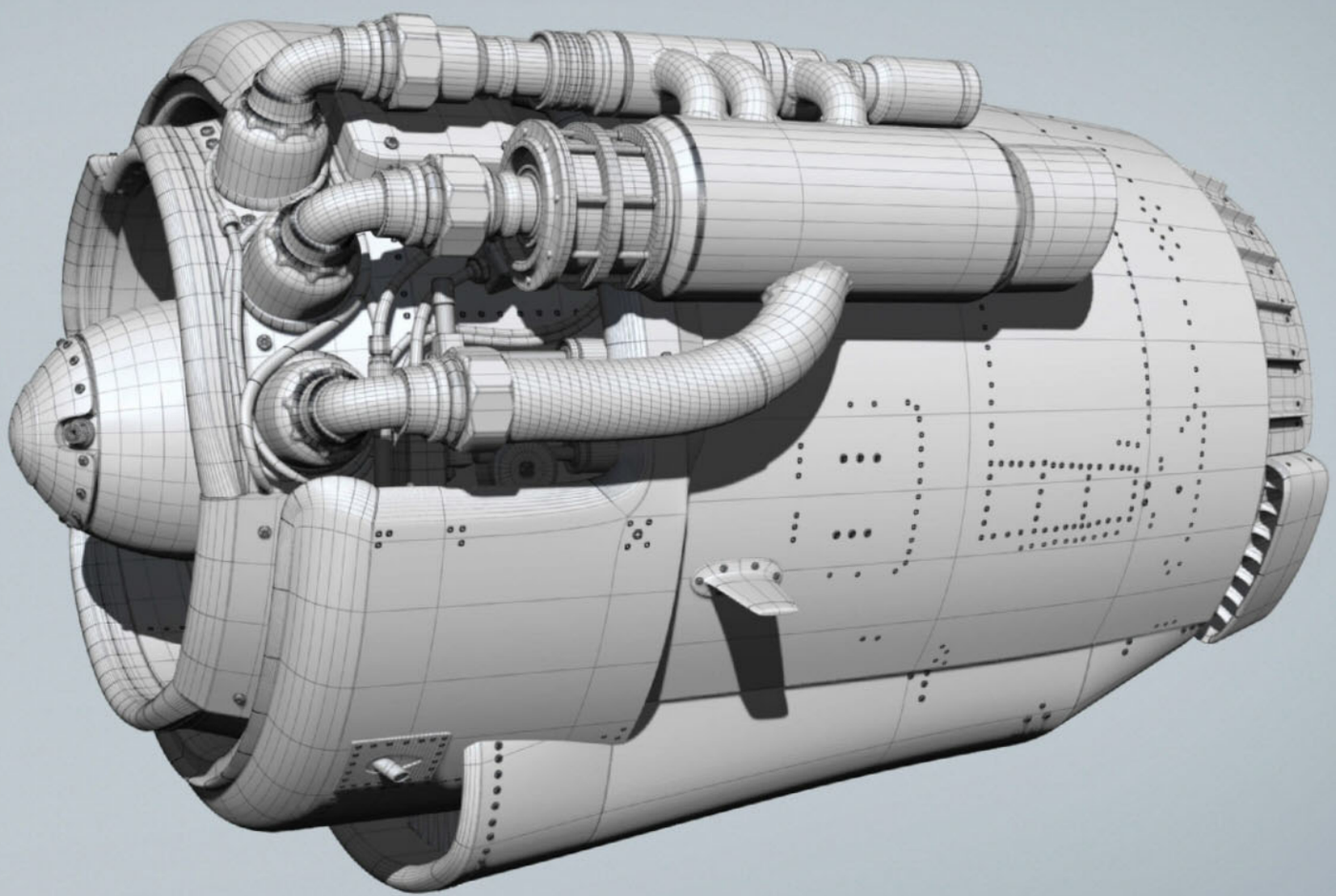
**Joseph Drust**
**josephdrust.com**

**Software** ZBrush, KeyShot, Photoshop

**Every new ZBrush feature revealed page 32**

"The Engine used a lot of the new features; ZModeler Brush, Dynamic Subdivisions, ArrayMesh, NanoMesh, ZRemesher 2.0, and of course, the ZBrush to KeyShot Bridge"

**Joseph Drust** teaches you how to get the best out of 4R7 **Page 34**



# Welcome

## To the magazine and 100 pages of amazing 3D

Welcome to **3D Artist**! It's amazing how much work can go into a software update. Just ask Pixologic – we finally have our hands on ZBrush 4R7, which represents a leap forward for the sculpting software and brings with it a host of new features. It's amazing when you consider this isn't even a full release. This is part seven of a long and successful saga that has seen ZBrush consolidate its position as a favourite among the 3D community.

Pixologic's desire to adapt and push the industry forward is admirable, and so this issue we've taken a special look at ZBrush 4R7 and its new features, beginning on p32. We've also asked beta tester and CG pro Piotr Rusnarczyk to bring you his verdict on the biggest software release of the year.

Elsewhere in the mag, Gleb Alexandrov is on hand yet again with a truly superb Blender tutorial on p56, the talented and preposterously young Mariano Tazzioli builds a robot on p40, and in an exclusive masterclass on p48 Ian Spriggs shows you how you can create incredible portraits as well as he can.

We also have the usual selection of in-depth tutorials, quality reviews and beautiful Gallery pages that make this magazine such a joy to create, with a brand new design to show off as well! Enjoy the issue.

**Dan Hutchinson,** Editor in Chief

Sign up, share your art and chat to other artists at **www.3dartistonline.com**

**Get in touch...** 3dartist@imagine-publishing.co.uk @3DArtist Facebook.com/3DArtistMagazine



3D Artist

Imagine Publishing Ltd
Richmond House, 33 Richmond Hill
Bournemouth, Dorset BH2 6EZ
☎ +44 (0) 1202 586200
**Web:** www.imagine-publishing.co.uk
www.3dartistonline.com
www.greatdigitalmags.com

## Magazine team

**Editor in Chief Dan Hutchinson**
dan.hutchinson@imagine-publishing.co.uk
☎ 01202 586283
**Production Editor Steve Holmes**
**Senior Staff Writer Larissa Mori**
**Production Editor Carrie Mok**
**Senior Designer Chris Christoforidis**
**Photographer James Sheppard**
**Senior Art Editor Will Shum**
**Publishing Director Aaron Asadi**
**Head of Design Ross Andrews**

**Contributors**
Gustavo Åhlén, Gleb Alexandrov, Orestis Bastounis, Jesper Børlum, Chris McMahon, Gustav Melich, Piotr Rusnarczyk, Ian Spriggs, Mariano Tazzioli, Amaru Zeas

**Advertising**
Digital or printed media packs are available on request.
**Head of Sales** Hang Deretz ☎ 01202 586442
hang.deretz@imagine-publishing.co.uk
**Advertising Manager** Alex Carnegie ☎ 01202 586430
alex.carnegie@imagine-publishing.co.uk
**Account Manager** Simon Hall ☎ 01202 586415
simon.hall@imagine-publishing.co.uk

**FileSlio.co.uk**
Assets and resource files for this magazine can be found on this website. Register now to unlock thousands of useful files. Support: filesilohelp@imagine-publishing.co.uk

**International**
**3D Artist** is available for licensing. Contact the International department to discuss partnership opportunities.
**Head of International Licensing** Cathy Blackman
☎ +44 (0) 1202 586401
licensing@imagine-publishing.co.uk

**Subscriptions**
To order a subscription to **3D Artist**:
☎ UK 0844 249 0472
☎ Overseas +44 (0) 1795 592951
Email: 3dartist@servicehelpline.co.uk
6-issue subscription (UK) – £21.60
13-issue subscription (UK) – £62.40
13-issue subscription (Europe) – £70
13-issue subscription (ROW) – £80

**Circulation**
**Head of Circulation** Darren Pearce ☎ 01202 586200

**Production**
**Production Director** Jane Hawkins ☎ 01202 586200

**Founder**
**Group Managing Director** Damian Butt

**Printing & Distribution**
Printed by William Gibbons & Sons Ltd, 26 Planetary Road, Willenhall, West Midlands, WV13 3XT

Distributed in the UK, Eire & the Rest of the World by Marketforce, Blue Fin Building, 110 Southwark Street, London SE1 0SU
☎ 0203 148 3300, www.marketforce.co.uk

Distributed in Australia by Network Services (a division of Bauer Media Group), Level 21 Civic Tower, 66-68 Goulburn Street, Sydney, New South Wales 2000, Australia ☎ +61 2 8667 5288

**Disclaimer**
The publisher cannot accept responsibility for any unsolicited material lost or damaged in the post. All text and layout is the copyright of Imagine Publishing Ltd. Nothing in this magazine may be reproduced in whole or part without the written permission of the publisher. All copyrights are recognised and used specifically for the purpose of criticism and review. Although the magazine has endeavoured to ensure all information is correct at time of print, prices and availability may change. This magazine is fully independent and not affiliated in any way with the companies mentioned herein. If you submit material to Imagine Publishing via post, email, social network or any other means, you automatically grant Imagine Publishing an irrevocable, perpetual, royalty-free license to use the material across its entire portfolio, in print, online and digital, and to deliver the material to existing and future clients, including but not limited to international licensees for reproduction in international, licensed editions of Imagine products. Any material you submit is sent at your risk and, although every care is taken, neither Imagine Publishing nor its employees, agents or subcontractors shall be liable for the loss or damage.

© Imagine Publishing Ltd 2015
ISSN 1759-9636

IMAGINE PUBLISHING

recycle
When you have finished with this magazine please recycle it

# NVIDIA® QUADRO® ACCELERATE YOUR CREATIVITY.

Accelerate your creativity with NVIDIA® Quadro®— the world's most powerful workstation graphics.

Whether you're developing revolutionary products or telling spectacularly vivid visual stories, Quadro gives you the performance to do it brilliantly.

| | |
|---|---|
| NVIDIA Quadro K6000<br>VCQK6000-PB | |
| NVIDIA Quadro K5200<br>VCQK5200-PB | |
| NVIDIA Quadro K5000 MAC<br>VCQK5000MAC-PB | |
| NVIDIA Quadro K4200<br>VCQK4200-PB | |

| | |
|---|---|
| NVIDIA Quadro K2200<br>VCQK2200-PB | |
| NVIDIA Quadro K2000DVI<br>VCQK2000DVI-PB | |
| NVIDIA Quadro K620<br>VCQK620-PB | |
| NVIDIA Quadro K420<br>VCQK420-PB | |

Learn more **www.pny.eu/quadro** & **pny.quadrok-selector.com**

**Insight**
uk.insight.com
Tel: 0844 846 3333

**Misco**
www.misco.co.uk
Tel: 0800 038 8880

**Dabs.com**
www.dabs.com
Tel: 0870 429 3825

**Scan Computers**
www.scan.co.uk
Tel: 0871 472 4747

PNY® Professional Solutions

**NVIDIA Quadro® / Tesla® / GRID™ / Prevail SSD**

NVIDIA.

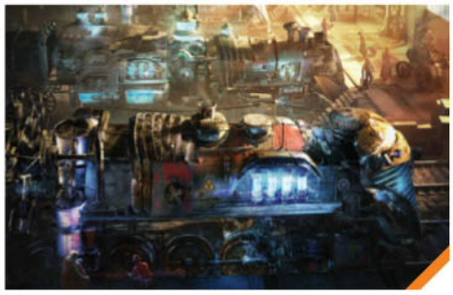
© 2014 NVIDIA Corporation. All rights reserved. NVIDIA, the NVIDIA logo, and Quadro are trademarks and/or registered trademarks of NVIDIA Corporation. All company and product names are trademarks or registered trademarks of the respective owners with which they are associated.

# The Expert Panel

## This issue's team of pro artists...

### IAN SPRIGGS
**www.ianspriggs.com**

We'll assume that you've seen Ian's work online – it's everywhere! He's a very talented chap, and he's kindly provided us with an amazing photorealistic portraits tutorial over on p48.
**3DArtist online username** Ian3d

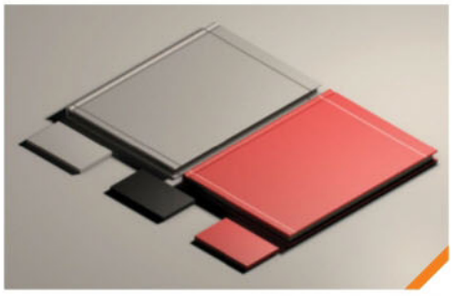


### GLEB ALEXANDROV
**www.creativeshrimp.com**

Gleb is the go-to guy for anything Blender, and this month he has put together an incredible, expansive 14-step tutorial for developing a steampunk environment in the free software. It starts on p56.
**3DArtist online username** n/a

### MARIANO TAZZIOLI
**mtazzioli96.cgsociety.org**

It's quite hard to believe that Mariano is actually still in his teens. Despite his tender years, he's managed to create an incredible robot with human features in his ZBrush tutorial on p40.
**3DArtist online username** n/a



### GUSTAVO ÅHLÉN
**www.gustavoahlen.com**

Gustavo is back, and this time he's on hand to walk you through creating photorealistic paper textures in Cinema 4D and Photoshop. Head over to p66 to check out his awesome tutorial.
**3DArtist online username** gustavoahlen

### AMARU ZEAS
**www.amaruzeas3d.com**

Through his work at *Forza Motorsport* developer Turn 10, Amaru has developed an incredible 3D skillset. In his tutorial on p64 he teaches you how to disintegrate an object in Maya.
**3DArtist online username** amaruzeas

### JESPER BØRLUM
**elementacular.alexandra.dk**

Jesper has used Maya plugin Elementacular in his tutorial on p68 to create realistic thunderclouds, taking a break from his work as a senior computer graphics engineer at Alexandra Institute.
**3DArtist online username** n/a

### PIOTR RUSNARCZYK
**www.sexy-polygons.com**

Who better to review ZBrush 4R7 than someone who has been involved with the beta program for months? Piotr has cast a critical eye over Pixologic's big update – head to p78 for his verdict.
**3DArtist online username** rusnar

### GUSTAV MELICH
**melich.org**

Continuing our big software reviews of the month, Gustav has put Houdini 14 through its paces for us on p82, looking into its new Animation Editor UI and more. Is it an update worth investing in?
**3DArtist online username** gmelich

### ORESTIS BASTOUNIS
**twitter.com/mrbastounis**

Where would we be without the technical eye of Orestis? This month he's put the Lenovo ThinkStation P500 under the microscope, as well as the SAPPHIRE AMD FirePro W7100 GPU.
**3DArtist online username** n/a

# DAVINCI RESOLVE 11

## DaVinci Resolve 11 now adds professional nonlinear editing to the world's most powerful color grading system!

DaVinci Resolve 11 combines the world's most advanced color corrector with professional multi-track editing so now you can edit, color correct, finish and deliver all from one system! With its legendary image quality, real-time GPU accelerated performance, and support for more wide dynamic range RAW formats than any other system, DaVinci Resolve has the creative tools professional editors and colorists need to work on Hollywood's most demanding projects!

### Integrated Editing and Grading

DaVinci Resolve 11 gives you professional editing and color correction all in one system so you can move between editing and grading with a click of the mouse! No more importing, exporting, or conforming ever again! Teams can have multiple colorists and assistants working with an editor on the same sequence at the same time! You get a true nonlinear workflow that lets you edit, grade and finish faster than ever before!

### Native Camera RAW

DaVinci Resolve works natively with all major RAW formats! Featuring the industry's most advanced de-bayer algorithms, Resolve preserves every detail captured by the camera's sensor. That means you can adjust exposure, shadows, highlights and mid-tones long after the camera stops rolling! With Resolve, you can create looks that simply aren't possible on other systems. The native RAW workflow means your final masters are literally first generation renders from camera-original files!

### Professional Nonlinear Editing

DaVinci Resolve's multi-track timeline lets you quickly ripple, roll, slip, slide, extend and shorten edits. The context-sensitive trim tool changes automatically based on the position of the mouse to make editing faster! Dynamic JKL trimming works on multiple tracks and can be done in the same direction or asymmetrically. Whether you use the mouse or keyboard, Resolve is easy to learn and has all of the tools professional editors need!

### Scalable Power

Hollywood's leading studios choose DaVinci Resolve because it handles incredibly high resolution images and massive amounts of data easily on super tight deadlines. Resolve is scalable and works on laptops up to massive multi-GPU systems connected to shared storage. Whether you're working on HD, 4K or beyond, DaVinci Resolve has the power, performance and creative tools you need to get the job done!

### DAVINCI RESOLVE 11 LITE

**Free download with unlimited nodes. Supports 1 GPU.**

**Free Download**

### DAVINCI RESOLVE 11 SOFTWARE

**Full Resolve with unlimited nodes and multiple GPUs. Use 3rd party control panels.**

**£665***

### DAVINCI RESOLVE 11

**Full Resolve with colorist control surface for the most advanced facilities.**

**£19,975***

www.blackmagicdesign.com/uk

*SRP is Exclusive of VAT

Blackmagicdesign

# Contents

What's in the magazine and where

## News, reviews & features


**10 The Gallery**
A hand-picked collection of incredible artwork to inspire you

**22 Technique focus: Bristol Bulldog**
Karen Stanley explains her approach to texturing and why she chose Quixel SUITE for layer management

**24 VFX Secrets: Chappie**
Behind the scenes of Neill Blomkamp's latest VFX-packed epic and the tools that Image Engine mastered to make it

**30 Technique focus: Motherland**
Learn shading and texturing tips from Alberto Casu and discover the reasons for using V-Ray blend shaders

**32 Return of the King: ZBrush 4R7**
It's finally here! We reveal all of the new features included in the biggest software release of the year and talk to the experts who got to play around with it in beta

**70 Technique focus: Pilgrimage**
Ding Zheng Wei explains his love of Tibetan art and culture and how he created the all-important hair parts

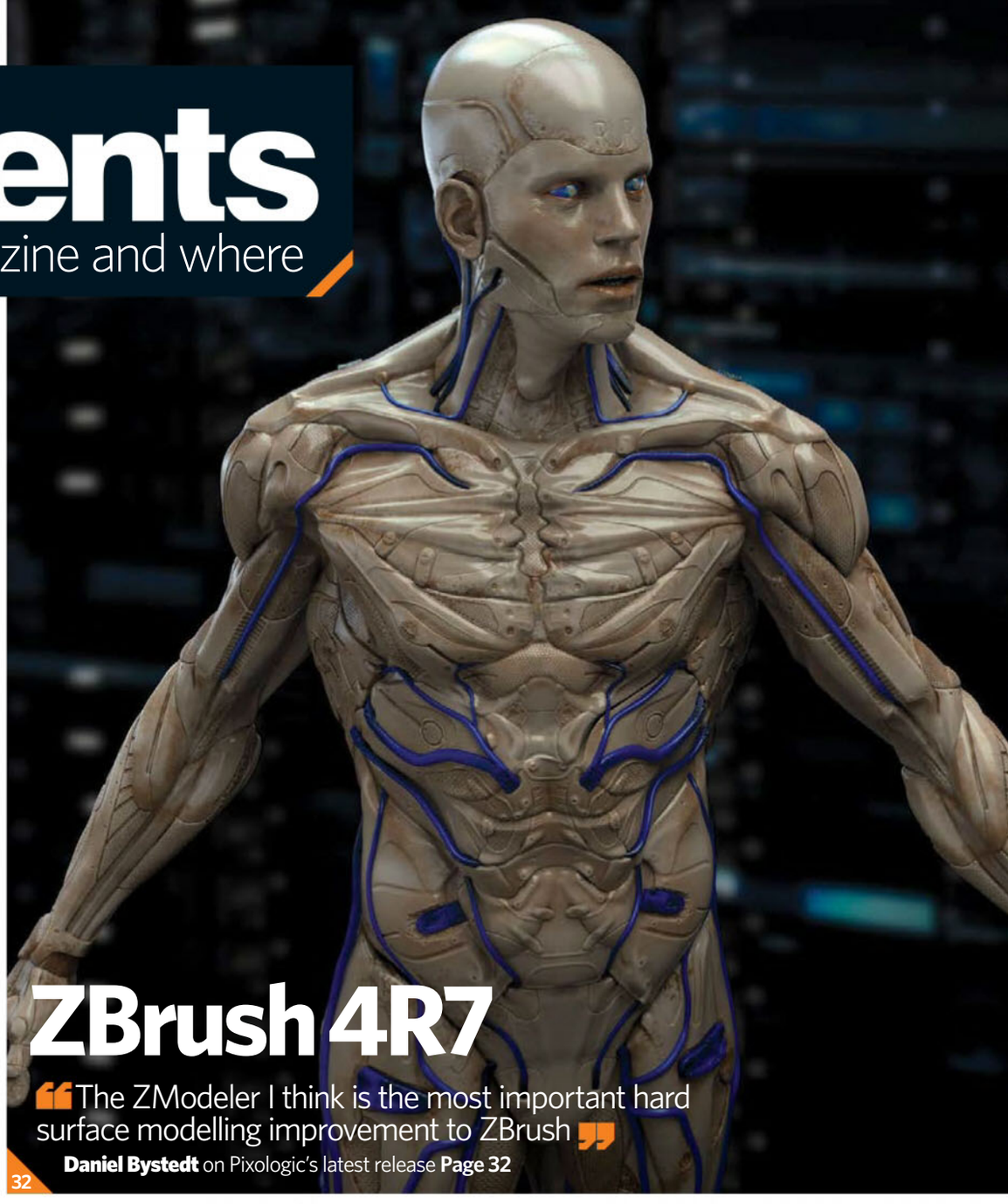
**72 Subscribe today!**
Save money and never miss an issue by picking up a subscription

**74 Review: Lenovo ThinkStation P500**
Discover what Orestis Bastounis thinks of Lenovo's mid-range workstation and its Nvidia Quadro K4200 GPU

**76 Review: SAPPHIRE AMD FirePro W7100**
Find out what Orestis thought of AMD's powerful GPU and how it stands up in benchmark tests to other graphics cards

**78 Review: ZBrush 4R7**
Piotr Rusnarczyk brings you three pages of ZBrush ruminations and his verdict on this substantial update

**82 Review: Houdini 14**
TD Gustav Melich takes a look at Side Effects Software's latest release and all of its new features

## ZBrush 4R7

"The ZModeler I think is the most important hard surface modelling improvement to ZBrush"

**Daniel Bystedt** on Pixologic's latest release **Page 32**

32

Disintegrate a model

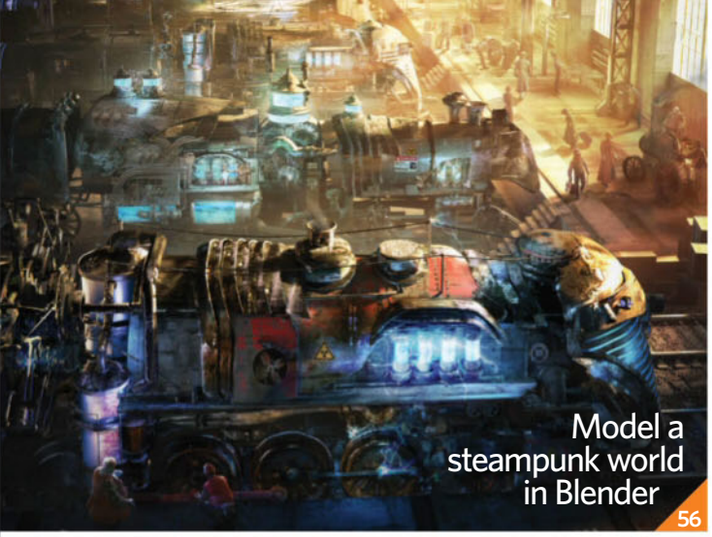
64

Generate a thundercloud

68


**SAVE 40%**
SUBSCRIBE TODAY

Turn to page 72 for details



# The Pipeline


**40 Step by step: Build a robot in ZBrush**
Mariano Tazzioli elaborates on his sci-fi workflow

**48 Step by step: Create stunning digital portraits**
Ian Spriggs is here to reveal his artistic inspirations

**56 Step by step: Model a steampunk world in Blender**
Gleb Alexandrov teaches you a thing or two about Blender

**64 Pipeline techniques: Disintegrate a model with nCloth and nDynamics**
Vehicle expert Amaru Zeas gets technical in Maya

**66 Pipeline techniques: Create paper textures in 3D**
Use Cinema 4D and Photoshop to create convincing textures

**68 Pipeline techniques: Generate a thundercloud using Elementacular**
Utilise this incredible Maya plugin to improve your workflow

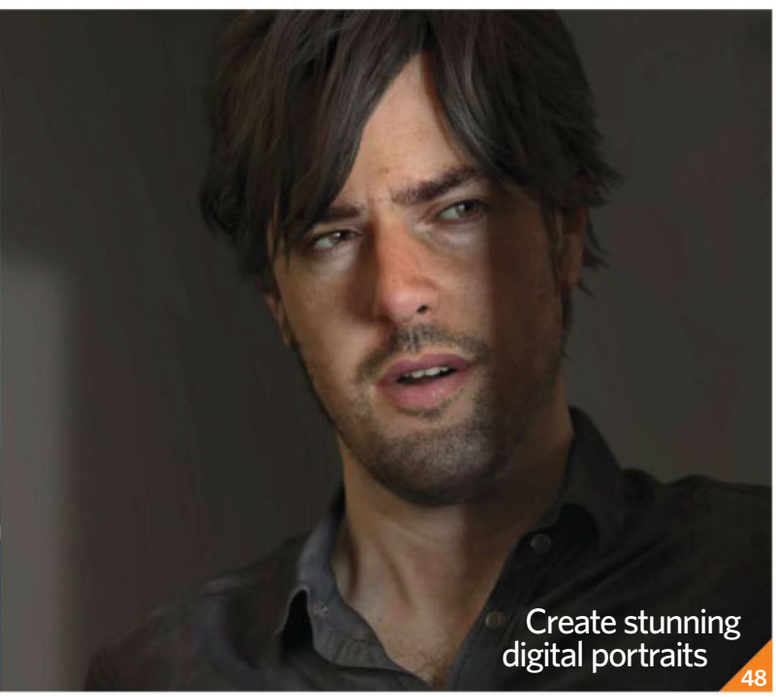

# The Hub


**86 Community news**
We catch up with the guys from the CG Student Awards and the Humster3D competition winners

**90 Industry news**
We look at Oculus’ new VR studio and its plans for the future

**92 Industry insider Christopher Dormoy**
The Ubisoft art director talks about branding and concepts

**94 Readers’ gallery**
The 3DArtistOnline.com’s community art showcase



DOWNLOAD FROM THE FileSilo

- 3+ hours of ZBrush videos
- HitFilm 3 Pro demo
- 25 3DTotal textures
- Premium models
- CGAxis HDRIs
- 20% Flatiron discount

Turn to **page 96** for the complete list of this issue’s **free downloads**
**filesilo.co.uk/3dartist**

Visit the **3D Artist** online shop at
imagineshop.co.uk
for back issues, books and merchandise

# The Gallery

Have an image you feel passionate about? Get your artwork featured in these pages
Create your gallery today at **www.3dartistonline.com**

"This is a concept I created to explore dynamism and develop a better understanding of composition. I was inspired by my favorite creatures like Xenomorphs, Predator and *District 9* Prawns for a hybrid creature"

**Riyahd Cassiem,** *Reavers,* 2014



**Riyahd Cassiem**
**www.riyahdc.wix.com/riyahd**

**3DArtistOnline username**
riyahdc

**Software** ZBrush, KeyShot, Photoshop

**Work in progress...**

**Mihail Vasilev**
**artstation.com/artist/mishmish**

**3DArtistOnline username:** mishmish

**Software** ZBrush, 3ds Max, Photoshop

**Work in progress...**

"Shortly before developing this concept, I was very impressed with the work of Aaron Beck and developments by Boston Dynamics. I think it's influenced my work"

**Mihail Vasilev,** *Warrior concept,* 2014

**Long Duc Nguyen Ho (Long Ho)**
**behance.net/ReFL-Studio**

Long Ho grew up in Vietnam and is passionate about using 3D to develop visual concepts

**Software** 3ds Max, V-Ray, AutoCAD, Photoshop

**Work in progress...**



"I choose this Industrial Apartment Project because I love these views and angles. The space of each room is not too big or too small"

**Long Ho,** *Industrial Apartment,* 2015

**Marcos de Moraes Sampaio**
**notan.com.br**

**3DArtistOnline username:** Sampaio

**Software** ZBrush, MODO, Photoshop

**Work in progress...**



"The sculpting, texture painting and bumps/displacements were created in ZBrush and taken to MODO using GoZ where I set the lights, shaders, hair and made the final adjustments to the model"

**Marcos de Moraes Sampaio,**
*Geek is the new Sexy,* 2014

“I used photos and *Forza Motorsport* as references. I created materials and light with one flat HDRI and V-Ray light. One of the best effects was done with DOF in V-Ray and achieved great results”

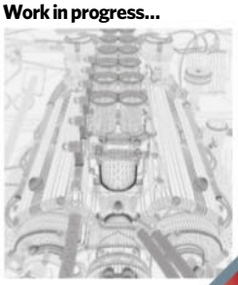
**Marcos Tonda,** *Engines,* 2013

**Marcos Tonda**
**behance.net/markinis**

Marcos has two decades of 3D experience, in everything from architecture to music videos

**Software** 3ds Max, V-Ray, Photoshop

**Work in progress...**



**Leandro Silva**
**leandrosilva.pt/ls_room**

**3DArtistOnline username:**
LS_ROOM

**Software** 3ds Max, V-Ray, Forest Pack, Photoshop

**Work in progress...**

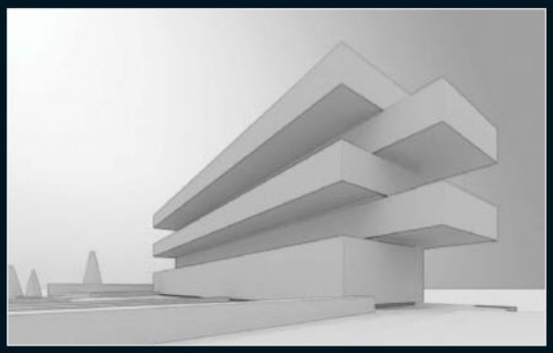
"Axis Viana Hotel represents an experimental project where the main intention was to achieve two different approaches in the development of our architectural visualisation: photorealistic and conceptual. In the photorealistic views we intended to build the most accurate reproduction of the building and its environment"

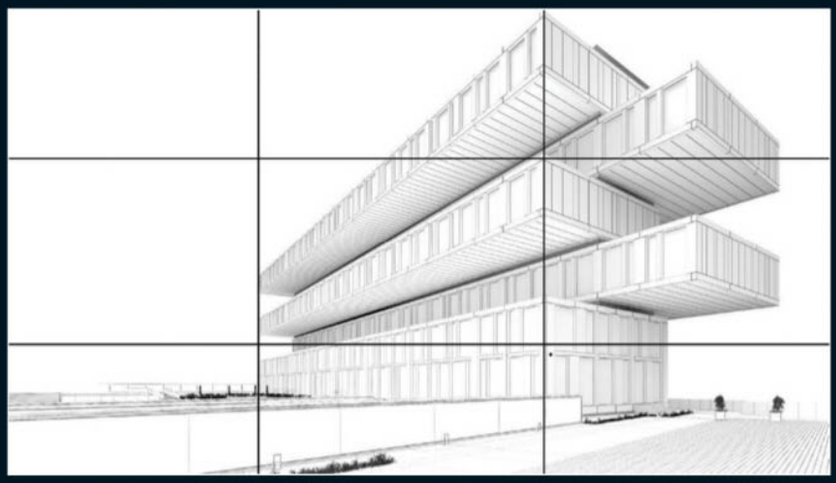
**LS • ROOM,** *Axis Viana Hotel,* 2014

 Architecture developed by VHM. Photographic references by Nelson Garrido

> For the conceptual images we wanted to reproduce what this building and its environment looks like in a postapocalyptic future after having stood the test of time

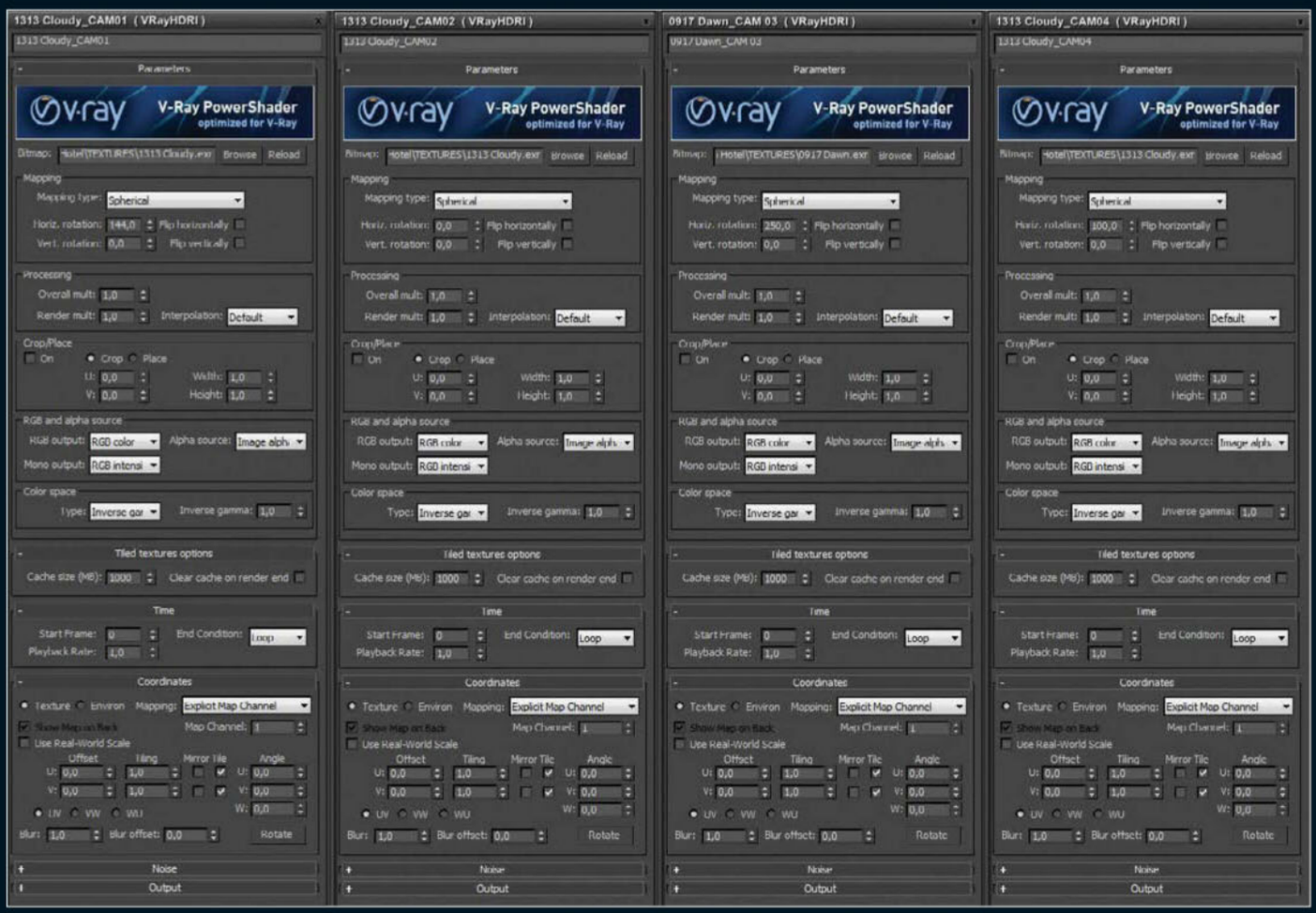
**LS • ROOM,** *Axis Viana Hotel,* 2014





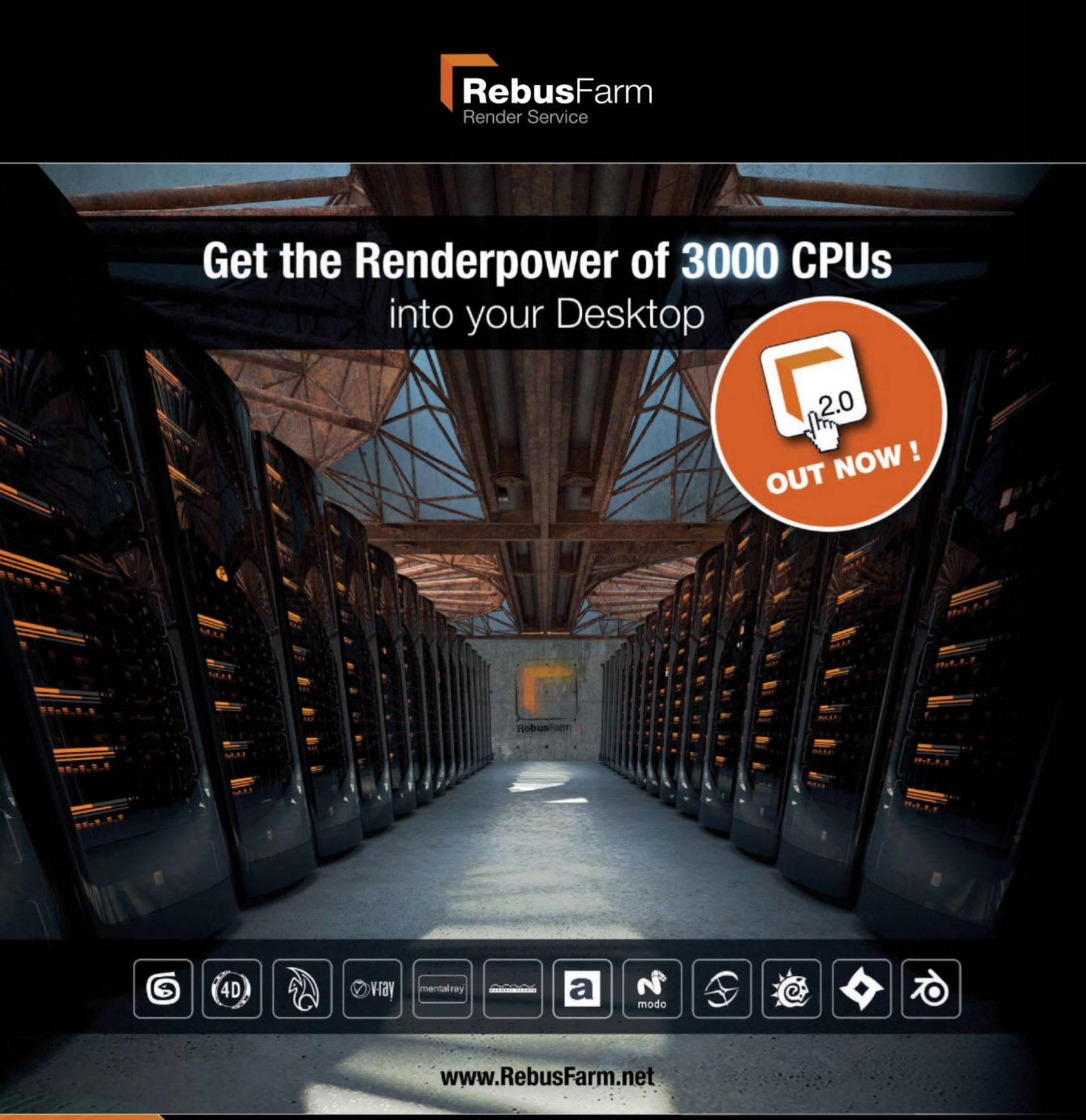
**COMPOSITION**
**TOP** We always try to keep as close as possible to real photography aspect ratios to avoid the distortions of a wide-angle focal length and explore the best composition for each view, using photographic references and the simple Rule of Thirds.

**MODELLING**
**LEFT** Usually we start modelling some basic geometry (simple boxes) to get the general proportions – they help us to explore the scene and to find the best angles. Then, progressively we move forward into the detailing of all elements in the scene.




**LIGHTING**
The light scheme for this project consists of an HDRI map (Peter Guthrie's HDRI 1313 Cloudy and 0917 Dawn) inside a VRay Dome Light (default), combined with a VRaySun to get soft shadows and some warm highlights in the two conceptual views.

**MATERIALS**
Material creation should always be done with real references in different light conditions to have a better understanding of the materials you want to re-create. Most of the textures are self-made, based on those from Arroway and CGTextures and with adjustments in Photoshop.

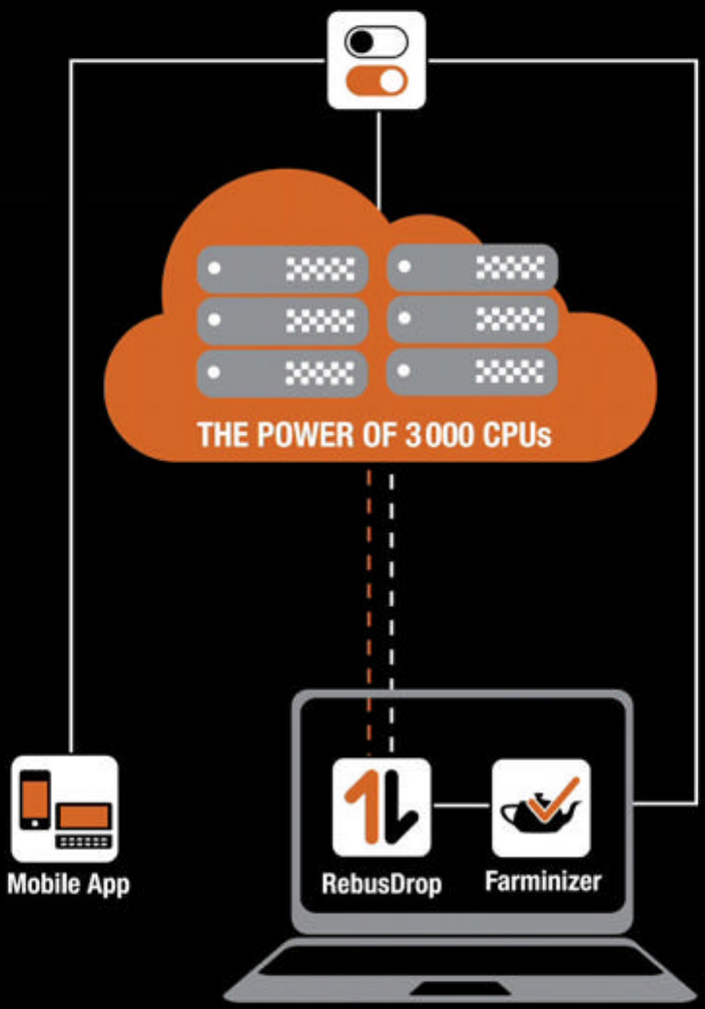



Making your deadline in time was never cheaper, easier and faster than now!

- Best price
- No waiting time
- Advanced apps and plugins
- All major software packages supported
- 24/7 processing and support

**35€**
**Free Trial**
Only for new registrants.
**Bonus Coupon Code:**
**3DA-RE-7X8396JQ**

RebusFarm 2.0
easier faster safer




RebusFarm 2.0 is your next generation render technology to harness the power of 3 000 CPUs. This means an easier workflow, faster live monitoring and safer realtime communication. Do you want to know more ? Scan the code below:

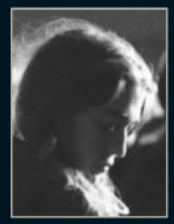
www.rebusfarm.net/rebusfarm2-0

**Or directly download the RebusFarm software at www.rebusfarm.net/lets-go/download**

# Technique focus

**Incredible 3D artists take us behind their artwork**

**TEXTURING** I tend to work heavily in masks and build up wear and tear layers. Quixel SUITE lends itself well to this workflow and helps with layer management and flexibility. With Knald's Low Poly AO bakes and Curvature maps in DDO, I can automate and add dirt build up in the right places – while in the masks, I can still go in and enjoy hand painting parts.



**Karen Stanley**
**Kazperstan.co.uk**
**3DArtistOnline username**
Kazperstan

**Software** Maya, Photoshop, Knald, Quixel SUITE, Marmoset Toolbag 2

**Bristol Bulldog,** 2014

Working with 8PACK Global #1 Overclocker

# RENDA

PROFESSIONAL WORKSTATIONS

8PACK
GLOBAL #1
OVERCLOCKER

## FREQUENCY ENHANCED WORKSTATIONS BY THE EXPERTS

**5 YEAR WARRANTY • BUILT & STRESS TESTED • CONFIGURABLE**

OVERCLOCKERS UK

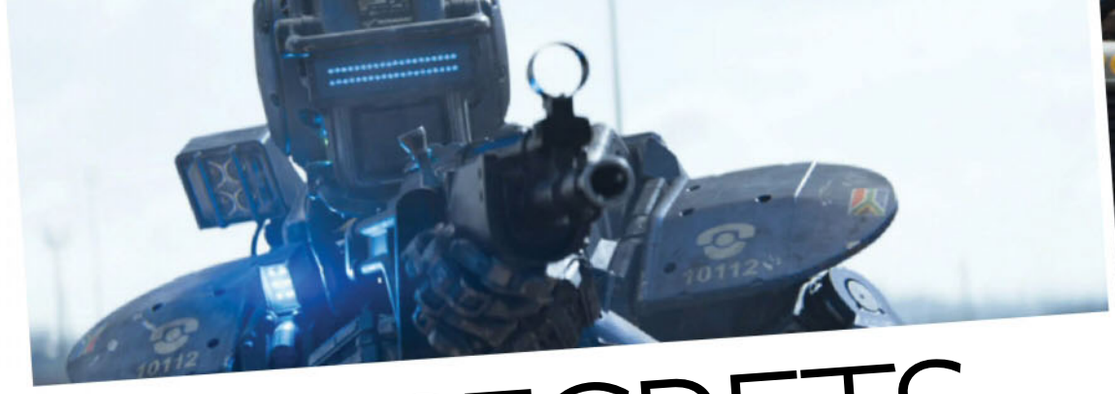
## www.overclockers.co.uk/renda

FREQUENCY ENHANCED WORKSTATIONS DESIGNED & ENGINEERED BY THE EXPERTS

Featuring Intel® Core™ i7 processor | Work and play with Intel Inside®

Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.

intel inside CORE i7



# VFX SECRETS CHAPPiE

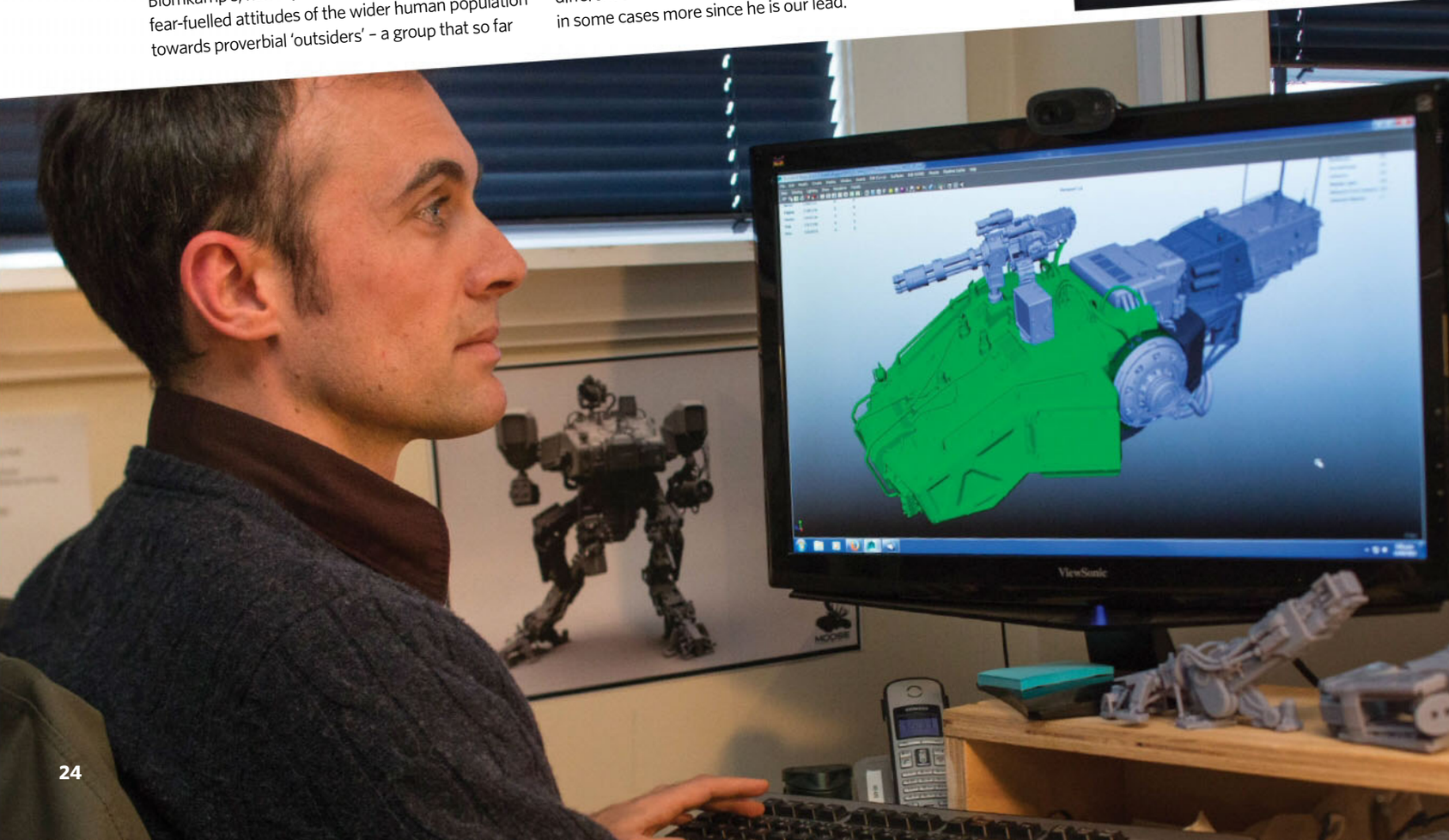
## Following its collaborations with Neill Blomkamp on District 9 and Elysium, Image Engine has injected its CG magic into Chappie

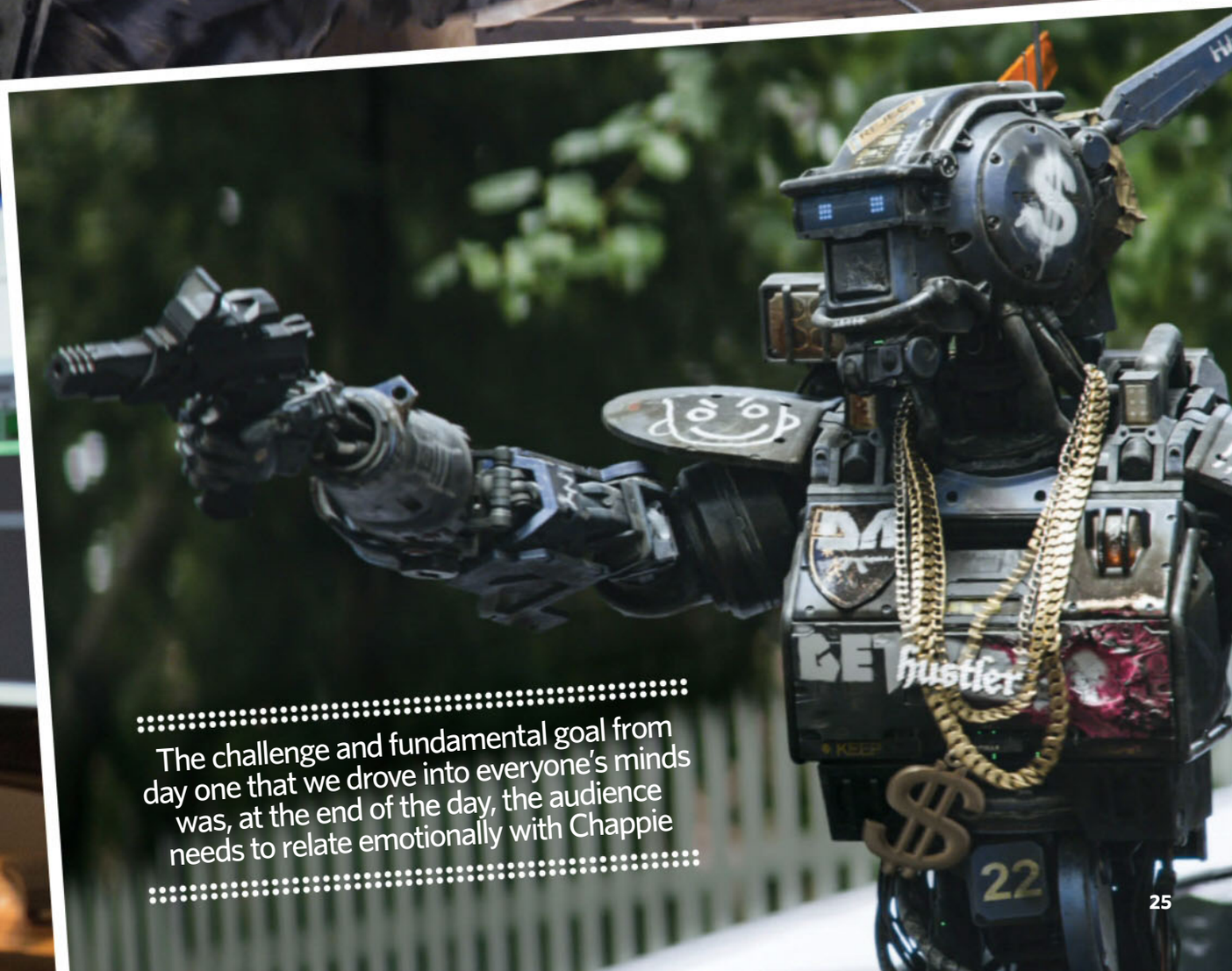
From the first glimpse of the alien mothership hanging forlornly above Johannesburg in *District 9*, director Neill Blomkamp and VFX company Image Engine seemed a perfect fit for each other. That was back in 2009, and six years after the tragic circumstances that befell Wikus van de Merwe in Neill Blomkamp's debut feature film, Image Engine has completed work on the director's third picture – *Chappie*.

The film focuses on a common rumination of Blomkamp's, namely the often bigoted and fear-fuelled attitudes of the wider human population towards proverbial 'outsiders' – a group that so far consists of stranded aliens in *District 9*, an impoverished and ostracised society doomed to die on Earth in *Elysium* and, now, a self-aware robot with a predilection for learning.

VFX supervisor Chris Harvey was charged with bringing Chappie to life digitally, while still capturing the emotional nuances of Sharlto Copley's on-set performance. "The challenge and fundamental goal from day one that we drove into everyone's minds was, at the end of the day, the audience needs to relate emotionally with Chappie at a level no different than any other actor on screen, and I guess in some cases more since he is our lead."

All film stills © Sony Pictures Entertainment






The challenge and fundamental goal from day one that we drove into everyone's minds was, at the end of the day, the audience needs to relate emotionally with Chappie

Neill Blomkamp has garnered quite the reputation for creating stunning, visually arresting films, due in part to his background as a 3D artist, and Image Engine has almost become an extension of the Blomkamp brand following its work on both *District 9* and *Elysium*. Chris Harvey, however, hadn't worked with the director prior to starting work on *Chappie*.

"Working with Neill was great," he begins, in earnest. "Not having been a part of either of his other two films, we first met roughly two years ago shortly after completing my work on *Zero Dark Thirty*. It was at that point that he was ready for Image Engine to start getting involved in actual work on *Chappie*. That's right – Image Engine [was involved for] over six months prior to shooting! Anyway, as work progressed and Neill and I got more comfortable with each other, the trust grew. In the end I found him immensely generous with sharing creative input – it's a big part of why working on this film and with him was such a pleasure."

As you'd expect, multiple software packages were utilised by Image Engine and the other VFX vendors that put their mark on *Chappie*. Image Engine was tasked with bringing all the movie's digital robots to life, including our eponymous hero, and so needed to develop an efficient 3D pipeline that encompassed third-party software and some proprietary tools as well.

"I'll focus on Image Engine's toolset for completing its work on Chappie himself," says Harvey, when asked which software was used to make the film. "Image Engine's main CG backbone is Maya, FX in Houdini, compositing in NUKE and for rendering we went with 3Delight. In addition to the primary packages, various disciplines employed MARI, ZBrush, Mudbox, Agisoft PhotoScan, 3DEqualizer and a variety of others.

"I would not say one stood out above the rest for the work we needed to complete, rather the 'special sauce', if you will, was the in-house proprietary toolset that ties all of these applications together and enabled a relatively small team to deliver over 1,000 shots and give Chappie roughly an hour of screen time. The foundation of that is the open source Cortex and newer additions like Gaffer, which are behind Image Engine's new look-development and lighting pipeline. We developed a lot of custom tools for managing the rendering, animation, simulations, damage progression, audio sync and other specifics for the film."

Before the production pipeline was developed though, the Image Engine team needed to dedicate time to research and development in order to develop a digital protagonist (based on practical models made by Weta) that the audience would truly believe is real. This realism would not only come from the 3D work that went into making Chappie look stunning, but also from advanced animation techniques that would make Chappie move and emote in a practical and familiar way.

"Quite often when dealing with VFX (particularly if there will be a practical version on-set) the progression will look something like this: concept art>practical builds for use on set>VFX teams replicate the practical build," Harvey continues. "The issue with this can be that the VFX teams that will ultimately have to bring this character to life are not part of the creative process – a process that can have significant impacts both technically and creatively on what their work will ultimately be. Neill saw that for Chappie to really work VFX needed to be involved from the very beginning. So the process on this was: concept art>VFX digital build>practical physical build>surfacing of physical build>digital build matching surfacing.

"During this early involvement we spent months on sorting out the jointing system for Chappie. He is one of the most complicated physically plausible digital assets I have worked with. His entire range of motion is something that actually works. In order to achieve this we had to write a new custom IK solver. All of his components are based on real-world objects, right down to the nuts and bolts, gears and hoses. There are many of his parts you could go to your local hardware or electronics store and purchase!"

> We spent months on sorting out the jointing system for Chappie. He is one of the most complicated physically plausible digital assets I have worked with

Harvey goes on to reveal more of the highly detailed lighting and look development procedures that contributed towards creating such a believable looking 3D model. "Beyond the modelling we also advanced Image Engine's look-development and lighting pipeline, moving to a completely ray-traced physical light and shader pipeline. Extensive and carefully planned textures and look-development shoots were completed on set, photographing the amazing practical builds from Weta Workshop under varying light conditions. Then, extreme care was taken by our assets department (after carefully calibrating all our source material) to paint matching textures and then create deep, layered shader networks that we could quite literally be placed into any physically based lighting environment and have Chappie's shaders respond physically accurately."

Considering Sharlto Copley's billing as the star of the film, you could be forgiven for thinking that Neill Blomkamp and Image Engine opted for lofty, time-consuming Peter Jackson levels of motion capture work. However, as Chris Harvey reveals, this wasn't the case with *Chappie*.

"We didn't use motion capture on this film (other than maybe 15 shots done as pick-ups later) – it seems to be a common misconception," he tells us. "Instead we relied on what's known as rotomation, where the animators hand keyframe over the actor's performance. The end goal is more or less the same – we want to capture the performance the actor conveyed on camera, but the process is different and it enabled a much more fluid on-set flow."

**TOP** The physical models produced by Weta Workshop for the film were key for blocking scenes and for reference

**BOTTOM** Weta has real pedigree when it comes to building models for film

Convincing viewers that what they are seeing on screen is real was a major challenge for the Image Engine team, and a lot of said realism needed to come from the animators' abilities to convey emotion under circumstances that were not ideal.

"Based on his design as a police robot that could be built more or less today, he didn't have a lot of facial features to perform with. We basically had three things: his overall body language, his ears and his brow/chin bar," explains Harvey. "Much time was spent on studying Sharlto's movements and the team of extremely talented animators then translating that into Chappie. He is a very talented actor and one that I think really understands the work that goes into creating something like this.

This made up one part of the look development for Chappie, but there was still a huge amount of

This is the MOOSE. All of the intricacies of these models were re-created digitally by Chris Harvey and his team of VFX artists
All images on this spread © Steve Unwin

work that had to be done digitally by Image Engine's VFX artists. "A single shot would begin on set with the collection of data," Harvey continues, when asked about the 3D work that went into making our robotic hero so lifelike. "We would photo survey the environment that Chappie was performing in and take plenty of reference images. And as is the standard we would take HDRI to capture the lighting that was used in the shot. However we would usually not take the standard one 360-degree rotational HDRI, but rather a number of them at varying heights and along Chappie's path of movement throughout a shot.

"Once the shot was turned over, our matchmove and layout team tracked the cameras and accurately placed the environment asset created from the photo surveys. Now while this 'environment' was never actually rendered it served a bigger purpose than simply a guide for animation or for catching shadows. The lighting set-up artists would process

## BY POPULAR DEMAND

A selection of Image Engine's most famous VFX projects

**Zero Dark Thirty**
Kathryn Bigelow's 2012 Academy Award-winning CIA film detailed the clandestine agency's efforts to track down Osama bin Laden following the terrorist attacks of 9/11. Image Engine was brought on board to produce over 300 shots for the film, including some incredible digital environments depicting sprawling military bases and CIA black sites – as well as prototype stealth helicopters – all overseen by VFX supervisor Chris Harvey.

**Elysium**
Neill Blomkamp's sci-fi tale of a secular, elite society living on a space station in orbit above Earth, and its ongoing conflict with those left behind on the planet's surface, represented a huge challenge for Image Engine. With the help of a few other VFX houses, Image Engine produced over 1,000 shots for the film, ranging from the lush, green vistas of Elysium itself to the dystopian slums of Los Angeles in the 22nd Century.

**District 9**
Image Engine's first collaboration with Blomkamp saw the company selected as lead VFX vendor for the critically acclaimed sci-fi drama. Of the 311 VFX shots that were produced for the South African director's debut feature, a huge proportion were made up of the digital aliens that inhabit the titular district in the film, as well as the huge, truly iconic alien mothership that occupies the sky above Johannesburg.

The stunning technical achievements of the Image Engine team are plain to see when studying the robot models in the film

our HDRI, triangulate the exact placement for each, and project them back onto the environment (created from the photo surveys), creating a replica of the lit environment. They would then replicate the on-set lights themselves.

"Now while all this was going on our animators would have started animation. Once they had reached high-level blocking for the shot we would cache and render as a QC (quality control) pass. The QC render was sent to the fine folks in BG prep – the unsung heroes doing the roto and paint clean up. It was their job to remove Sharlto from every shot."

He continues: "If there were any FX needs, such as the chains he wore in nearly half the film, an automated process would kick off. This process would cache the animation, correctly read in the appropriate state of Chappie, pass that data out of Maya and into Houdini automatically, pulling in the appropriate assets and ultimately launching the simulations for the gold chains.

"Out the other end of this process would pop another daily and geometry cache with an animated Chappie wearing fully simulated chains. Of course this didn't work for each shot but it served as an initial setup that the FX artists could jump in and adjust if necessary."

The result of all of this highly technical work is extremely impressive. There are parts of the *Chappie* VFX pipeline that are a little unorthodox at first glance, but when all the individual parts come together, Image Engine's irrepressible talent for incredible visual effects really shines through. The final piece of the puzzle lay in compositing, but as Chris Harvey reveals, even this wasn't straightforward, owing to the need for lip-syncing work on a robot with no lips...

"Chappie doesn't have lips, but as a main character he does have to speak a lot. This was indicated on him by a small LED strip just below his facial speaker. We made the decision early on to place this task in compositing because we knew that with a hero character, dialogue is apt to be adjusted, re-recorded and so on late in the film-making process as part of ADR. There was no way we could react to those changes if we had to push things back to animation and through all subsequent steps just to adjust lip-sync. We had to keep every shot live right up to the end so we could change it in the final weeks."

> In the end I found him immensely generous with sharing creative input – it's a big part of why working on this film and with him was such a pleasure

It all comes back once again to the director's overarching desire for Chappie to be as real and nuanced as possible, something that seems to have been non-negotiable during the film's development and appears to have been accomplished admirably by Image Engine.

"Neill placed a very aggressive demand on the film, and in this case Image Engine. He never wanted the grey suit Sharlto to be seen by audiences. Of course this has nothing to do with Sharlto himself as he was in many ways the 'soul' of Chappie, but rather he wanted the audiences to only ever see Chappie as Chappie, and never as a human. So what did that mean for us? Well, it meant that for the very first test audience screening, barely two and a half months after filming wrapped, we had to deliver close to 900 Chappie shots! It was gruelling to be sure, but the benefits were tremendous."

Chappie is in cinemas 6 March in the UK and North America. For more information, please visit www.sonypictures.com/movies/chappie.

## CHAPPiE STATS

The big numbers at the heart of our plucky robot hero

**Poly count** (pre-sub divided polys)

**3,976,511**

**Objects**

**2740**

**UDIM texture tiles for Chappie** **538** **Texture resolution per UDIM tile** ranges from **256-4096**

**Total number of texture maps** for ALL versions/damage states

**56148**

## ARTIST STATS

For Image Engine, the studio responsible for all robot shots

There were roughly **150** artists on the film (probably a few more that touched it briefly, and then the production crew, editors, coordinators, and so forth on top of that). The full team for shot production was on for roughly a year, but the artists responsible for the assets builds were on for almost two years.

man machine

AUTODESK.
Authorised Training Centre

# Man and Machine Training Academy

## Man and Machine offer an extensive range of Autodesk 2015 training courses

**Man and Machine** specialise in **Autodesk training** for Manufacturers, Engineers, Architects & Product Designers.

All courses are taught with the official Autodesk courseware and include one month's free post-training support.

### Autodesk AutoCAD courses include:

- **AutoCAD** Essentials
- **AutoCAD** Electrical Fundamentals
- **AutoCAD** Advanced
- **AutoCAD** 3D Drawing & Modelling
- **AutoCAD** Mechanical Essentials

E: marketing@manandmachine.co.uk
W: www.manandmachine.co.uk T: 01844 263 700

Connect with us

# Technique focus

**Incredible 3D artists take us behind their artwork**

**SHADING & TEXTURING** V-Ray blend shaders enabled me to reach a certain level of complexity. Then VRayDirt was used as a mask to reveal scratches along the edges or to layer dirt based on ambient occlusion. V-Ray MultiMatte lets me tweak shaders for more realism. What I couldn't achieve in this way was added in directly with Photoshop.

**Alberto Casu**
**www.albertocasudigital.com**

Alberto currently works as an asset/environment TD at MPC London

**Software** Maya, ZBrush, MARI, V-Ray, NUKE, Photoshop

**Motherland,** 2014

# www.scan.co.uk

t: 01204 47 47 47 **3XS SYSTEMS PRO GRAPHICS** SCAN COMPUTERS

## Creative results are built with creative hardware

## On spec. On budget. On time.

Award-Winning Scan 3XS Graphics Workstations.

**Scan 3XS GW-HT15** Built for Pros with Intel Inside®.

Graphics & CAD workstation with NVIDIA Quadro K4200 graphics and an Intel® Core™ i7 5820K CPU.

- Intel® Core™ i7 5820K, Overclocked to 4.2GHz
- Asus X99-S Motherboard, Intel X99 Chipset
- 4GB NVIDIA Quadro K4200 - Supports 4 displays
- 16GB Corsair Vengeance LPX DDR4 2666MHz
- 120GB PNY Prevail Solid State Drive
- 2TB SATA3 Hard Drive
- 3 Year Premium Warranty

THIS SPEC, FROM **£2109** Inc VAT

intel inside CORE i7

### Building success

Speed and efficiency are the building blocks of a successful project, and a graphics workstation must deliver both. Ultimate performance, accurate calculations, low power consumption and rock-solid reliability are the hallmarks of a Scan 3XS graphics workstation.

Don't buy hardware without Scansure protection. Insure yourself with 28 day installation damage www.scan.co.uk/scansure

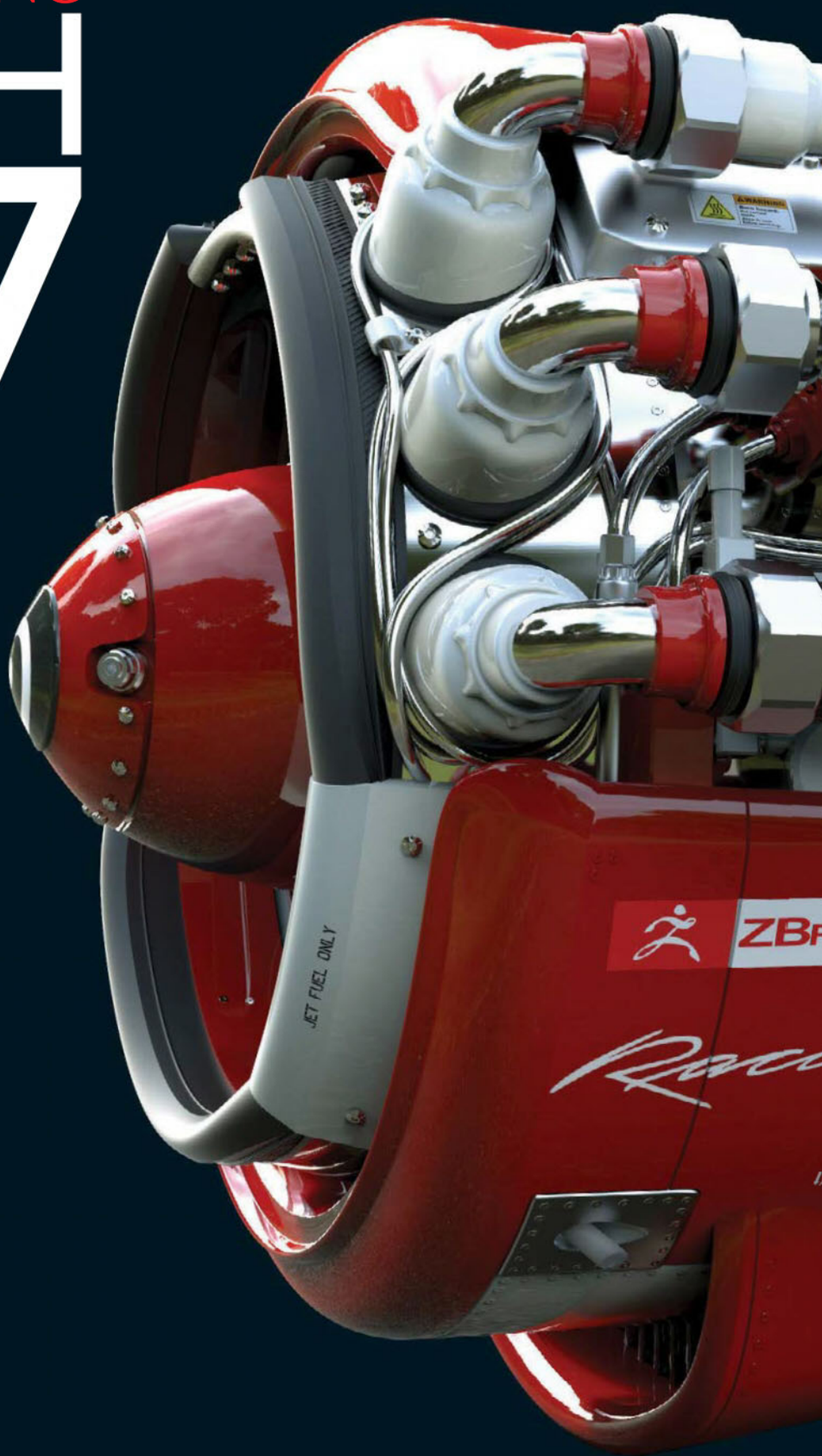
SF Scan Finance. Pay 10% deposit now, spread the remainder over 36 or 48 months. Scan business lease. Spread your business expenditure over 24 or 36 months.

Intel, the Intel logo, Xeon and Xeon Inside are trademarks of Intel Corporation in the U.S. and other countries.

Classic credit options (36 or 48 months). Customers will initially only have to pay a 10% deposit, with the orginal loan amount payable over 36 or 48 months. *Example: £1,000.00 Deposit: £100.00 Amount of loan: £900.00 Total charge for credit: £276.12 Total payable:£1276.12 Total 36 Monthly instalments of:£32.67 APR:19.9%. Terms and Conditions Apply

# RETURN OF THE KING
# ZBRUSH 4R7

## We take an in-depth look at all the new features of the biggest 3D software upgrade of the year




If any team could be described as the true rock stars of the CG industry today, it would be the developers over at Pixologic.

When the ZBrush Debut Version .90 was first released at SIGGRAPH in December 1999, it inspired an entire community of artists – some of whom hadn't done any artwork in years – to start creating again. A whole new type of artist was born: the 3D sculptor. Incredibly, every ZBrush update has been free to existing licence holders ever since.

Today, after years of successful innovations and packing every update with a host of new features, Pixologic is more popular than ever before. The launch of 4R6 in 2013 reportedly led to more site traffic for the team than what CNN receives at peak hours. This year introduced an even more highly anticipated release with ZBrush 4R7.

With an optional 64-bit version and KeyShot rendering capabilities, as well as a whole new set of hard surface modelling tools, ZBrush 4R7 looks to be better than most Pixologic fans were anticipating. To learn more about the extent of this release and even what 5.0 could bring, we asked the beta testers (who have been using 4R7's features for months before the official release) to tell us all there is to know about the piece of software that's currently rocking the CG community.

## THE BETA TESTERS

**DANIEL BYSTEDT**
dbystedt.wordpress.com

**JOSEPH DRUST**
josephdrust.com

**IOANNIS KARATHOMAS**
jkarathomas.com

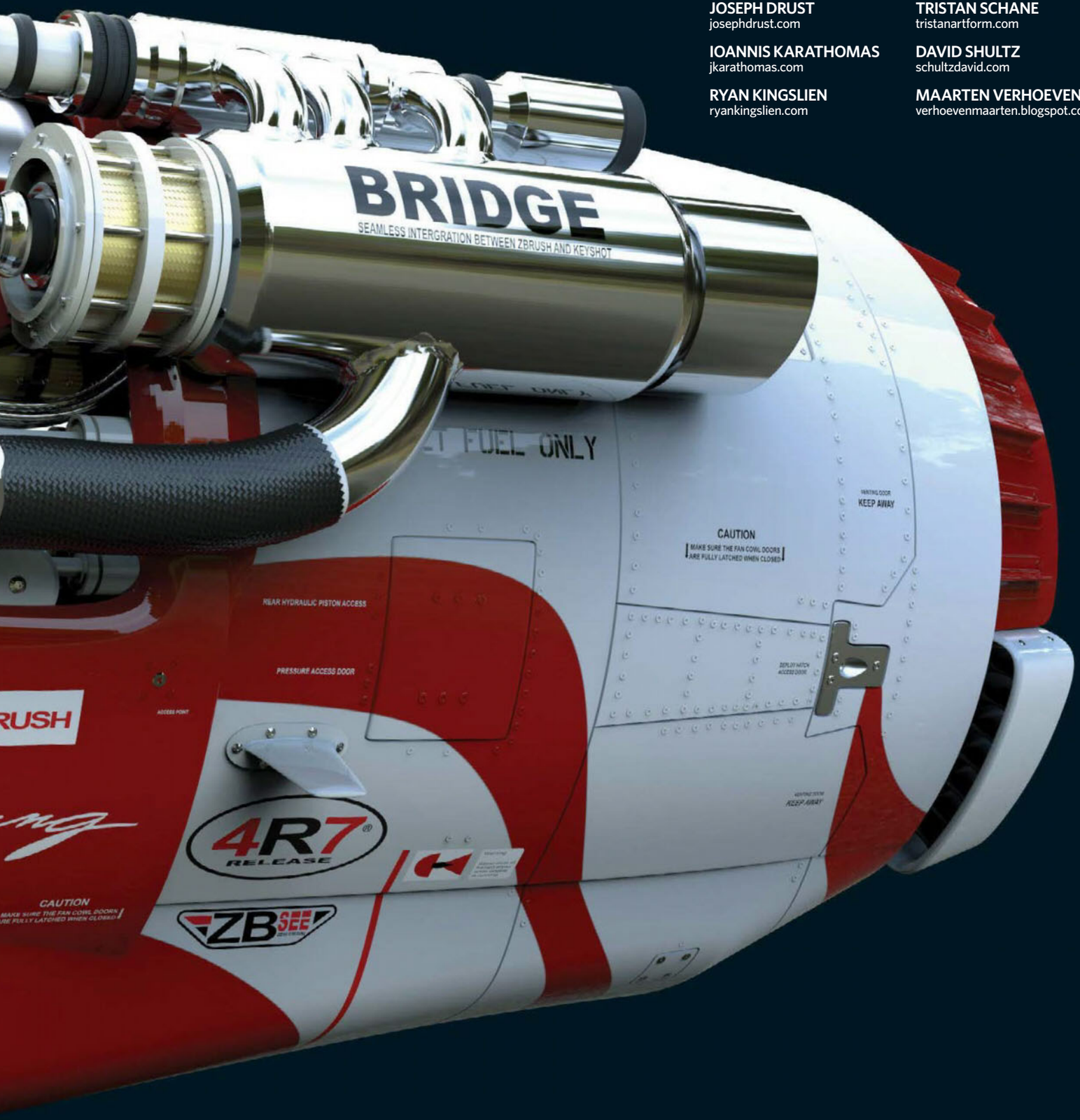
**RYAN KINGSLIEN**
ryankingslien.com

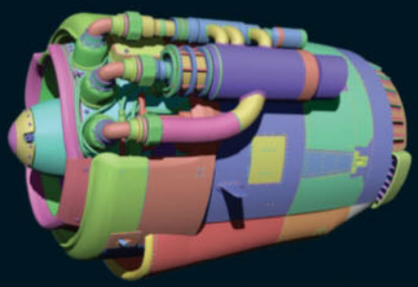
**GEERT MELIS**
geertmelis.com

**TRISTAN SCHANE**
tristanartform.com

**DAVID SHULTZ**
schultzdavid.com

**MAARTEN VERHOEVEN**
verhoevenmaarten.blogspot.co.uk





## JOSEPH DRUST
## ENGINE BREAKDOWN

The Engine used a lot of the new features; ZModeler Brush, Dynamic Subdivisions, ArrayMesh, NanoMesh, ZRemesher 2.0, and of course, the ZBrush to KeyShot Bridge. The whole engine started off as a simple PolyMesh3D Cylinder that was manipulated with the ZModeler Brush.

01 The ZModeler brush enabled me to quickly go in and describe different silhouettes and surface changes using the Poly QMesh and Poly Bridge Connected Polys Actions. Once I had the main form blocked out I used the ZBrush to KeyShot Bridge to send the model over to KeyShot to get another perspective on it and started modelling the smaller elements. I would constantly resend the model to KeyShot with the Bridge while working.

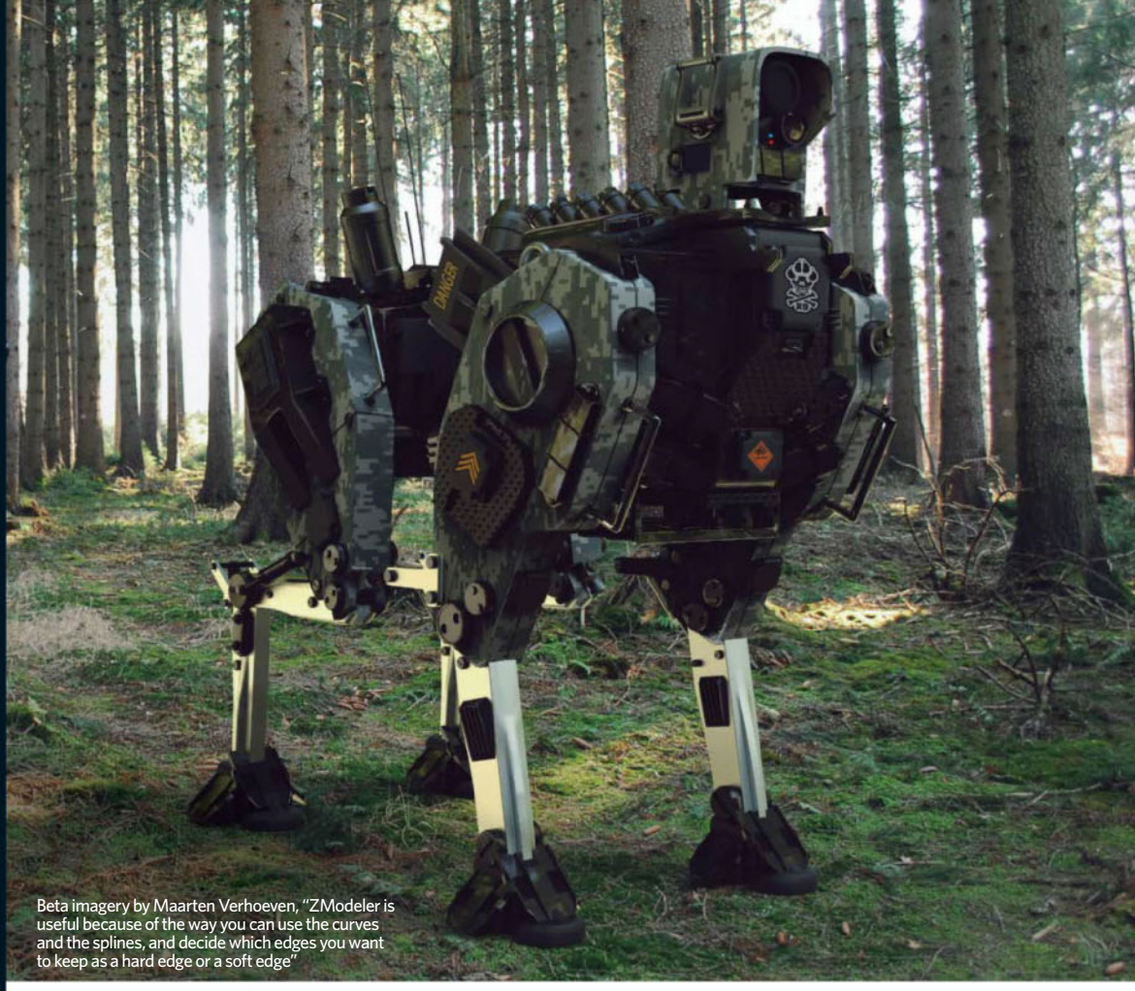
02 Using the ArrayMesh I quickly populated elements such as the exhaust pipes around the central axis precisely controlling the position. Using PolyGrouping I established creased areas that, when used with the Dynamic Subdivisions, generated nice clean results. The wires and rivet elements were created using ZModeler's InsertMesh and InsertMesh Curve brushes.

03 For any highly detailed areas, like the exhaust filter and the carbon fibre area, I used NanoMeshes. I quickly PolyGrouped off an area and applied the NanoMesh using the ZModeler brush. After this NanoMesh was applied I adjusted the settings until I got the desired result. The Edit Mesh function enabled me to isolate and adjust the single NanoMesh object using the ZModeler brush.

04 Once all the main areas were completed I converted the Dynamic Subdivision parts to traditional subdivisions. I then used Slice Brushes to establish PolyGrouped Panel areas. Once these areas were cut I used the ZRemesher 2.0 KeepGroups option with SmoothGroupsBorder set to 0. This generated new topology that flowed exactly around the sliced PolyGroups. Then I used the PanelLoops functionality to give these areas thickness and beveling.

05 The texture elements were applied inside of KeyShot using Labels. This let me easily position high-resolution decals on the model without PolyPainting or UVs and Texture Maps. The entire model was rendered inside of KeyShot without any postprocessing in Photoshop.

You can find a time-lapsed video of the engine creation on ZBrushCentral at **bit.ly/1796Co2**.




Beta imagery by Maarten Verhoeven, "ZModeler is useful because of the way you can use the curves and the splines, and decide which edges you want to keep as a hard edge or a soft edge"

## THE NEW FEATURES
## 64-BIT SUPPORT

As perhaps one of the most highly anticipated features to be updated within ZBrush, 64-bit support is a very welcome new addition to 4R7 – it will be the first edition of ZBrush to include it.

Due to the complex nature of going from 32-bit to 64-bit, however, the Pixologic development team has very prudently decided to provide both applications with 4R7. Automatically included with every download is the official 32-bit program and a second executable: the 4R7 64-bit preview. This is so that if there are any problems when testing the 64-bit, artists can always go back to 32-bit. The ZBrush 5 series will then discontinue 32-bit support and will only be available in 64-bit.

With 64-bit support, ZBrush can now fully harness all available computer memory and processing power in your machine, enabling higher polygon counts as well as less lagging so that creating art becomes much faster. "Working in the 64-bit version is a lot faster," says Daniel Bystedt, character artist at Bläck Studios. "There's a bunch of times when you sit with 50 million polygons and then you realise you have to have [the polygon count increased] and you have to split the creature into bits, sculpt all those different bits, then make a map and that's hard! It's really nice to see a 64-bit version to deal with situations like this."

"I felt like in terms of overall scene management and performance it was great," adds David Schultz, who is environment artist at Red Storm Entertainment. "The other day at work I had a scene that I had to decimate because it was just starting to lag, and I put it in the 64-bit version and it had no problems! There's so much time you waste on just scene management and it just frees you up to do cool stuff, which is great."

## ZMODELER

With ZBrush 4R7 comes the ZModeler brush: a new polygonal modelling system that truly opens ZBrush up to hard surface creation like never before. With it, artists can easily create base meshes fully within ZBrush so that modelling doesn't need to be a process that involves importing and exporting from another program such as 3ds Max or Maya.

Best of all, starting to use it is as simple as hovering over a point, an edge or polygon and pressing the space-bar for different option menus. "Mostly in the past I've been into organic modelling, but lately I've been starting to do more hard surface stuff," confirms Bystedt. "The ZModeler I think is the most important hard surface modelling improvement to ZBrush."

One of the tools Bystedt's been most impressed by is the QMesh action within the ZModeler brush. "It lets you easily just move vertices round and merge them with other vertices, really speeding up the entire workflow." The QMesh action can even let users easily remove blocks of polygons or extract an area to create a new polygonal island.

## ZBRUSH THE ROAD TO 4R7

**1997**
Pixologic is founded

**1999**
The ZBrush Debut Version .90 is available for purchase and is also announced at SIGGRAPH

**2000**
ZBrush recieves the 1999 Innovation Award from *Computer Graphics World* for creating "3D content without calculations, wireframes, or NURBS." The ZBrush commercial version 1.0 is available for PC, whereas demo version 1.03 is available for Macintosh

**2001**
ZBrushCentral opens to give the ZBrush community a place to share tutorials, tips and images

Karathomas then used ZRemesher 2.0 and added more details like bolts, cuts, surface damage and industrial cut lines

"It also helps that they added in the Dynamic Subdivisions stuff," adds Schultz. As another new addition specifically created to work with the ZModeler, the Dynamic Sudivision system gives users the ability to create the appearance of smooth geometry with effects such as bevel. These are all done in real-time without the need for traditional subdividing, so that the user is always editing at base mesh level.

"It has some problems around curved surfaces and you can't always use it," warns Schultz, "but when it works you can automatically get bevels and chamfers, and if you want different bevel lengths you can break up your object in different ways and it keeps your scene really light, but it looks good."

## ZREMESHER 2.0

The ZRemesher was first introduced in ZBrush 4R6, providing an automatic retopology solution that enabled artists to drive the flow of new polygons as they retopologised with the help of curves. But with the release of ZBrush 4R7, the tool has evolved into ZRemesher 2.0. It now generates improved surface quality with an automated helic removal system that has far better support for hard surfaces than its predecessor, the first ZRemesher.

"When you used the 4R6 ZRemesher to create a nice new clean topology for your mesh, a problem with it was that it was creating spiral edge loops that flowed all around the mesh," explains lead environment artist at Darkside Studios, Ioannis

## TRISTAN SCHANE
## RUR BREAKDOWN

**01** I started directly with old-style box modelling of a humanoid form. I used ZSpheres to begin with, making an Adaptive Skin and then the Polymesh 3D. I stay low res and start building out the form with basic brushes – I have customised versions of the brushes I like. At the beginning it will largely be Move, Standard, Clay Tubes, Dam_Standard and Flatten. I will then divide up a couple of times, but still stay pretty low res. I'm just blocking in forms. When I'm happy enough with the overall forms, I delete the lower subdiv levels and switch to a low-res Dynamesh.

**02** Using the same basic brushes I continue to sculpt the form. I use the Dynamesh Group button to break up the mesh into what will be early separate SubTools. I use Split Polygroup to break the tool up into SubTools. I then use ZRemesher 2.0 to turn these Dynamesh SubTools into very low-res polys and start sculpting again.

**03** As I started to develop the form of the mesh, I started using ZModeler to refine the topology for that SubTool, ie the face. I also start thinking ahead to how I will want to break some of these SubTools up into smaller SubTools and start refining the topology.

**04** At some point when I had the sculpt pretty far along I added the exterior vascular system. The wires were created by freezing the subdivisions of the SubTools and then using the CurveTube brush to draw in the wires where I wanted them. I would then use the Move brush and Transpose tools to refine their shape and position. I also used ZRemesher 2.0 to fix the topology for the details.

**05** Nearing the end of the sculpting phases I start to PolyPaint, then add the final painted and sculpted details simultaneously. Lastly I UV everything using ZBrush's UVMaster and generate texture maps from the PolyPaint. When the sculpting and painting was done, it was on to KeyShot to start my render-to-final image workflow.

**2007**
ZBrush 3.0 enables full 3D sculpting and texturing with advanced digital clay – up to 1 billion polygons using HD Geometry are now useable

**2009**
Decimation Master with its 3D Printer export functionality marks a huge plugin set, released for many industries. GoZ is included in version 3.2

**2011**
ZBrush 4R2 is released, introducing DynaMesh for the first time. Other updates include LightCap and Insert Brushes

**2013**
ZRemesher, which is central to the release of ZBrush 4R6, evolves ZBrush's automatic retopology tool – reducing tasks that used to take days to mere minutes

**2015** ZBrush 4R7 is released!

Karathomas. "In the new ZRemesher they fixed that. Now, when you want to remesh a cylinder, for example, you don't have a spiral edge loop that goes from top to bottom. It creates a nice low-mesh topology really quickly and cleanly."

"We tried it and not getting those spirals anymore on legs and arms is great," agrees Bystedt. "It really responds better to those ZRemesher guide curves."

## NANOMESH

"4R7 is the largest ZBrush release yet and the new tools have enabled me to take my artwork to places I've never explored," reveals artist and creative development manager at Pixologic, Joseph Drust. "If I had to pick one favourite new feature though, I'd have to go with the NanoMesh tools."

Combined with ZModeler, the new NanoMesh sytem will let artists populate instance geometry along the surface polys of a model, so that you can add more complexity and detail to what you create while still maintaining a low poly count. The NanoMesh geometry can then be edited whilst on the surface to add variations to instance scale, offset, angle, random distribution and multiple alignment options using the NanoMesh tab under the Tool palette, or even quickly changed to another type of model altogether.

"The ability to quickly block out a shape with the ZModeler brush and then populate surface details with NanoMesh is amazing," Drust continues. "The NanoMesh also enables you to deform the Surface Placement Polys after the NanoMeshes have been applied. This enables you to populate a surface with NanoMeshes then go back in and add more irregulation and surface break-up if needed."

"NanoMesh is the best," exclaims Karathomas, "when I was testing it I built a rock, then with NanoMesh I managed to duplicate that rock as much I wanted, spread the duplicates randomly, rotate them, move them and then change the proportions again all at random. The best part is it's all instances so they don't house memory or make your file heavy, but you can still convert them as a mesh and export."

## ARRAYMESH

"The ArrayMesh is another game changer," says Drust. "Like NanoMesh, ArrayMesh enables users to create instances of any initial mesh inside of ZBrush and take them to a whole new level. Whole arrays can be created within seconds from a single mesh, making hard surface modelling ridiculously quick and easy to detail.

"The ArrayMesh enables you to use the Transpose lines to manipulate how the Array will be generated," Drust explains. "This enables more of an artistic control allowing for complex twists, scales, and rotations to be applied creating unique models. In addition to all this, the ArrayMesh also has stages that can enable you to create complex Array chains generating arches, ovals, or even rollercoaster-esque designs."

"To populate tires across a vehicle, all you need to do is model one tire then use the ArrayMesh, with mirroring and offsets, to place them correctly in all of the wheel wells," he continues. "If you need to change the wheel just adjust the original mesh and the rest of the wheels will be updated."

## ZBRUSH TO KEYSHOT

Another first for the team at Pixologic has been two new products: ZBrush to KeyShot Bridge and KeyShot for ZBrush. KeyShot for ZBrush is a special version of KeyShot 5 that has all the features of KeyShot HD, except it has unlimited render resolution and can only import models via ZBrush and the KeyShot Bridge. Meanwhile the KeyShot Bridge can be used to connect ZBrush to not just KeyShot for ZBrush but any version of KeyShot 5, which is useful for existing KeyShot customers.

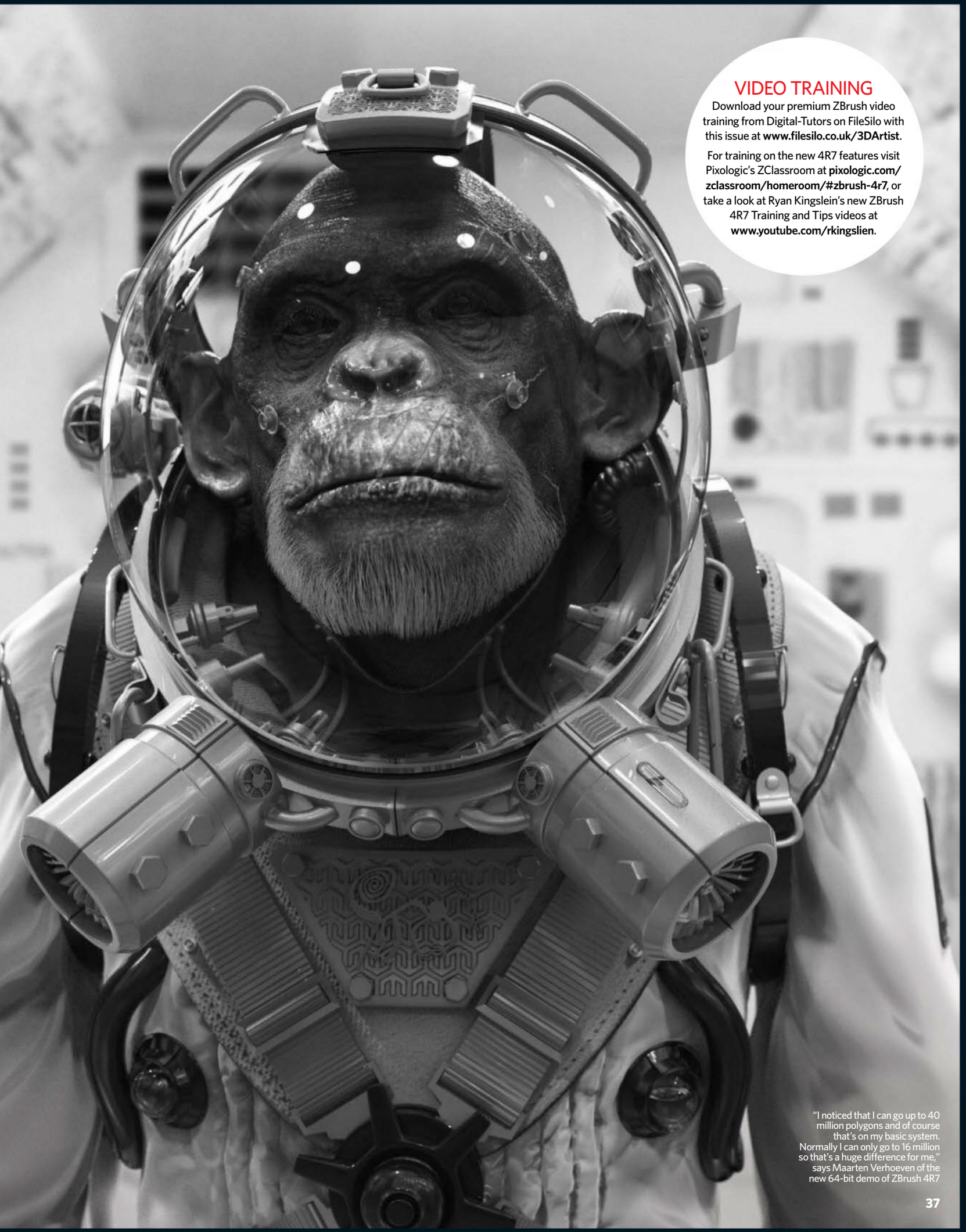
## MAARTEN VERHOEVEN Q&A ON THE ZMODELER

**What was your favourite new addition to 4R7?**
For me it was the ZModeler tool, because it was the first time that we could use hard surface sculpting. That was something that was very different for ZBrush because I always used it for organic forms and creatures, but this is just a game-changer for hard surface modelling in a sculpting program. For creating the base meshes it's also very convenient.

**Did it change your workflow a lot?**
I always used to create hard surface models in ZBrush, that's the easy thing now because there are tools available to use that are a lot faster than box modelling. ZModeler is useful because of the way you can use the curves and the splines, and decide which edges you want to keep as a hard edge or a soft edge.

**Was the ZModeler crucial for you when creating your beta test images?**
For the space ape, the thing that really changed a big part of things for me was the making of the full-body suit. That was completely created with the ZModeler tool. When you look at the suit, the places where the bolts are generated around the wrists and around the legs – you can insert meshes following different poly loops and that's how those were done. So if you wanted to create something like a track from a tank, you could model an elipse form or something like that, and then insert all the separate pieces of the track going around the elipse by just selecting one and dragging it out!

**Could you take us through the workflow that went into creating the suit?**
For the original ape I used ZBrush's old method of hard surface modelling to create my first suit. When I heard that 4R7 was coming out I decided to redo the complete suit again with the new tools. I especially liked the new version because that suit was created in three days, so it worked really really fast. Now in the future I will do more hard surface creations – I'll do more droids, I'll do more robots. Those are all things that I also like to sculpt, but the workflow was a bit too messy and clunky in the past.

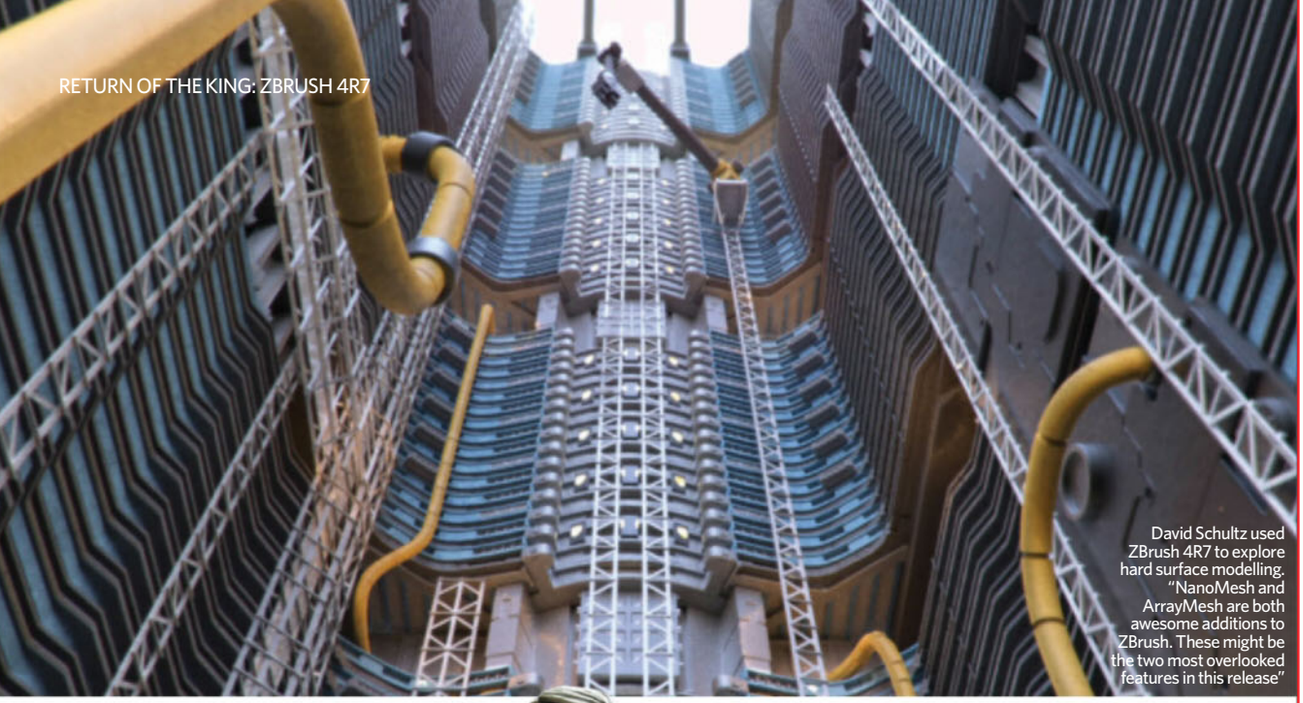


## VIDEO TRAINING

Download your premium ZBrush video training from Digital-Tutors on FileSilo with this issue at **www.filesilo.co.uk/3DArtist**.

For training on the new 4R7 features visit Pixologic's ZClassroom at **pixologic.com/zclassroom/homeroom/#zbrush-4r7**, or take a look at Ryan Kingslein's new ZBrush 4R7 Training and Tips videos at **www.youtube.com/rkingslien**.

"I noticed that I can go up to 40 million polygons and of course that's on my basic system. Normally I can only go to 16 million so that's a huge difference for me," says Maarten Verhoeven of the new 64-bit demo of ZBrush 4R7



David Schultz used ZBrush 4R7 to explore hard surface modelling. "NanoMesh and ArrayMesh are both awesome additions to ZBrush. These might be the two most overlooked features in this release"

## GEERT MELIS
## ANNA CREW MAGDALENA

01 First, I sculpted a fairly detailed model of the complete character starting from a very low poly female base mesh.

02 Next, ZModeler was used to model the jewellery, belts, boots and weaponry – only the handgun was from an older ZBrush model that I reused. Tip for those interested: the handgun ships with ZBrush and you can find it in LightBox>Projects>Etcher_Firepower. I have to say that the ZModeler Brush is my favourite among the new additions. Although I was used to box modelling in ZBrush, it wasn't very straightforward because there was no dedicated toolset. ZModeler is very artist friendly, every function is accessible at all times by simply pressing the space-bar. It's very hands-on, almost like sculpting with low-poly geometry. ZModeler sort of grew on me; I started out using only the most basic functionalities and, as I spent more hours modelling, I started to use and implement more functions as needed. The new Dynamic Subdivision levels are great to get a good preview of how the model will behave when it's subdivided for sculpting or PolyPainting.

03 Finally, I sent the model over to KeyShot and added materials. I exported one-pass renders. Previously, I spent too much time fiddling with render settings, render passes and combining render passes in Photoshop. KeyShot gives me the results I want in a very short time. The images I use now are one-pass KeyShot renders with very little postprocessing work – only some slight level and colour adjustments.

04 NanoMesh and ArrayMesh are now being used to create the environments for the characters' world, which I hope I will be able to finish soon. I use ArrayMesh to preview the building by instancing one wall, one window and one pillar/column. As I continue to refine these three parts, ArrayMesh updates all the instances for the entire building. I also used NanoMesh to quickly place individual roof tiles on the building.

"I'd never used KeyShot before and I got really hooked on it," reveals Schultz. "Things would look great in ZBrush and then I'd send them over to KeyShot and it'd be like 'wow!'"

"The usage of the ZBrush to KeyShot Bridge enables me to get another perspective on the models I am working on quickly and easily," adds Drust. "I can quickly sculpt changes in ZBrush and with one click send the model over to KeyShot to see how it would look under different lighting conditions, camera focal lengths, and with different real-world materials.The single-click ease of use makes this functionality superb; no longer do I need to export and import a bunch of files."

For anyone who doesn't already own KeyShot 5, at the time of writing, both the KeyShot Bridge and KeyShot for ZBrush can be purchased as a bundle at a discounted price of $249 (£162). This is incredible considering the full KeyShot HD is an industry standard renderer normally priced at $995 (£650).

To receive the discounted bundle price of $249 for the ZBrush to KeyShot Bridge and KeyShot for ZBrush, add *both* products to your shopping cart when you are in the store.

## OTHER ADDITIONS

- FBC Import/Export free plugin, supporting texture, displacement maps, blendshapes and more.
- The BPR Render system can now render all Surface Noise as displacement, deforming the mesh to match procedurally created noise attributes.
- Replay Last can now reapply to any model portion.
- Background images applied with the Grid system can now project onto your model for a painted guide.
- Start any sculpt with the new polygonal Cube, Sphere and Cylinder primitives.
- Automatically centre the Transpose line on any unmasked, partially visible or symmetrical piece of geometry with one click.
- Copy and paste Tools, SubTools and Projects.
- Now hold Shift to switch on Dynamic Draw Size to avoid accidentally turning it on.

Buy ZBrush from $795 for a Single User Licence at **store.pixologic.com** or upgrade for free if you're a registered user at **pixologic.com/zbrush/downloadcenter/instructions**.

## ZBRUSH 5

**ZBrush 4R7 will be the final iteration in the ZBrush 4 series before ZBrush 5.0 – so what new tools could the new 5 series bring? We asked the beta testers for the features that would be ideal for a ZBrush 5 release**

I did mention to Pixologic that as an artist I would like to have a group folder system to group SubTools, rotate and move them without having to merge them and lose subdivisions. **Ioannis Karathomas**

Scene management, so if you could have folders and hierarchies with SubTools. If you're using KeyShot you can split all of your SubTools up per material to keep materials in KeyShot and so that creates a lot of SubTools. It gets pretty nasty if you need to move a group of things that are all split up. I'm positive that they know this and I hope that they will come up with something cool for 5.0. **David Schultz**

What I would most like would be for them to develop the texturing side of ZBrush – it's responsive, it's fast, you have the layers, but I would love blending modes within the layers – things like that. Plus, sometimes you need to have a higher resolution of your texture on the model itself. I do texturing in ZBrush right now, but there's a point at which I have to go to another application to do small details. **Daniel Bystedt**

I'd like to see some more precision, I think that's the other big thing that is missing. When it comes to really precise things like 'I need this to be this size', or 'this cut needs to be exactly here', that sort of stuff is a bit harder to do and requires other programs. The other thing is to just do things I hadn't thought of! When I look at ZBrush I'm sitting there thinking 'I want this and that', but I'd like to see them keep creating stuff that you never even thought about doing the way they have done it. **David Schultz**

Holographic interactivity. Think that is too much to ask for? **Ryan Kingslien**

# KeyShot® 5

## Amazing renderings and animations. In minutes.

## KeyShot 5. Out now.

KeyShot is widely recognized as the fastest rendering software on both Mac OS X and Windows for look dev and pre-viz concepts or creating promo art and production visuals. Fast. Easy. Amazing. This is KeyShot.

Model by Steve Talkowski
sketchbot.tv

Download at:
keyshot.com/try/

All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

# Build a robot in ZBrush

## Construct and render a convincing mech using a human base

This tutorial is about creating a robot scene as cinematographically as possible and to give the robot enough personality to be believable.

We are going to start off by sculpting a human bust from a sphere, and defining all of the proportions and anatomy. Then we will start to robotise a human bust and work on building the robot.

Then we will discuss Maya modelling and UVs. Once the design is done we will decimate the ZBrush mesh and pass it to Maya as reference for modelling the high-resolution model with proper topology and UVs to texture it.

Then we will look at 3ds Max rendering, where we will use V-Ray as our render engine. In here we will define all the materials, shading, textures and lighting as well as rendering the final image.

Finally we will move on to compositing with the final touches to the final render being done in After Effects to colour correct the robot. We will then add a background and add some effects like the atmosphere particles.

Every part in this tutorial was equally exciting because each of them involved designing a new idea and allows us to explore the unknown.

> The best thing to do is model everything in quads because they work smoother and are cleaner

**MARIANO TAZZIOLI**

*Robot Gaze,* 2014/15

### Software

ZBrush, Maya, 3ds Max

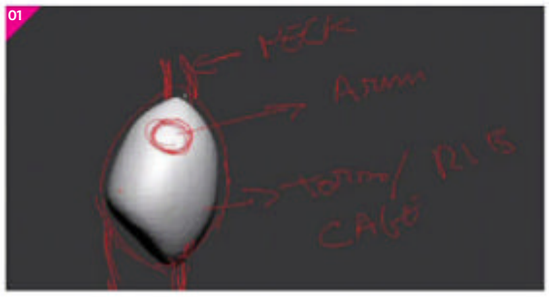
### Learn how to

- Translate your ideas from your brain to the computer
- Sculpt a human bust in ZBrush
- Master hard surface techniques in ZBrush
- Robotise a model
- Design a robot
- Translate the rough design to a high-resolution model in Maya
- Use retopology tools
- Utilise UVs
- Prepare the scene for a high-resolution render (shading, lighting)
- Composite

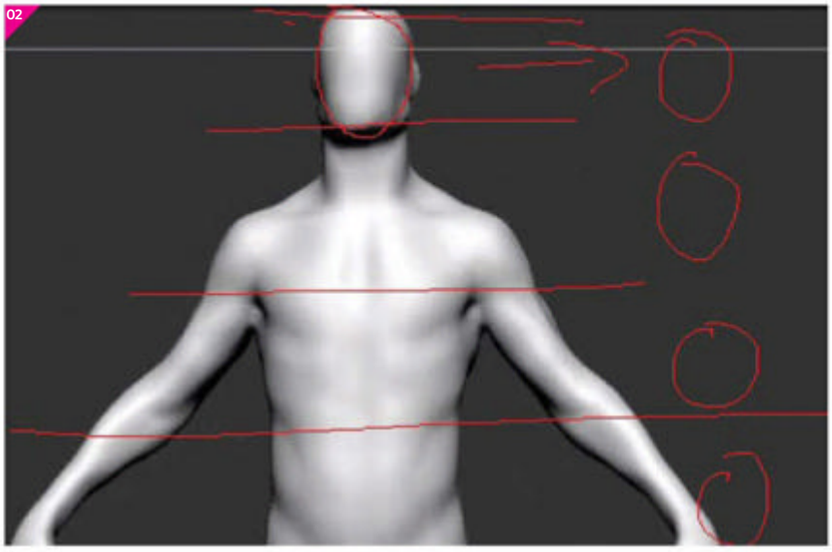
### Concept

I wanted to create an emotional and cinematic scene – a scene that is powerful, emotionally speaking and in terms of composition.

**01 Defining the shapes** We are going to start from a sphere. The first thing to do here is to define the rib cage, because this will give us a starting point or a reference from where to pull out all the extremities. It's important to keep looking at a reference to do it well. Don't worry about any details now, just focus on getting the main shapes right and we will tackle the details later. After we have the rib cage form, we can pull out the neck and the head from the top. After that we are going to extract the arms and hands and make sure that the shapes are right.



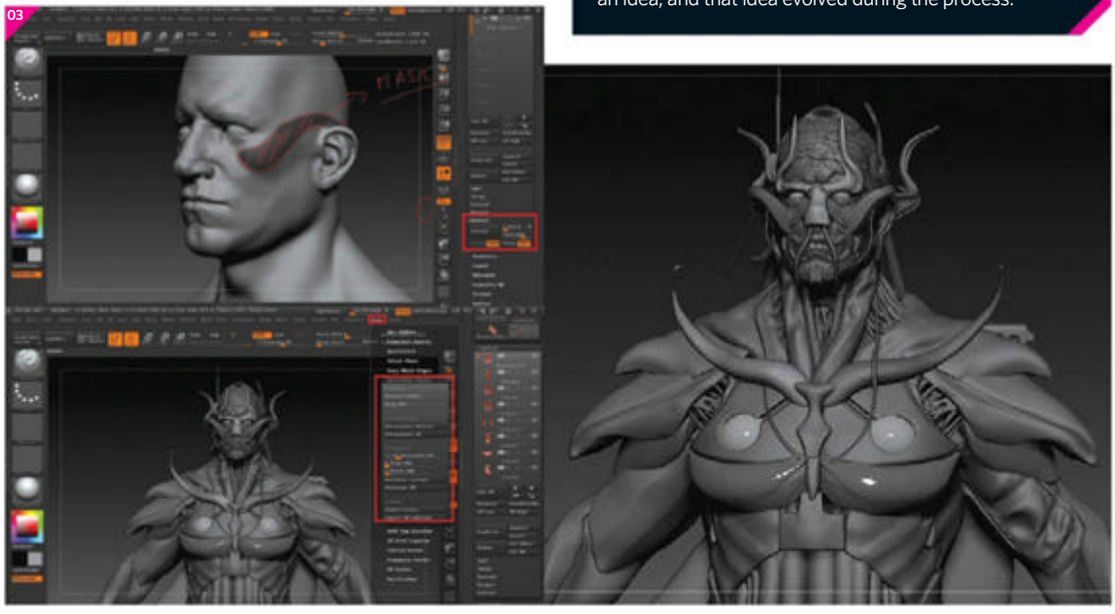

**02 Work with anatomy** Once we have the bust blocked out in rough forms, we have to look at it as a whole and start to relate each part that we pulled out to each other to make sure they fit well. Once again it's important to look at a reference when doing this. Since we knew from the beginning that we were going to do a hero character, we went for heroic proportions. Once you have established the basic proportions you can start to define the main muscle groups, and after that you can start to add details.




**03 Design and export** For the design we can start to extract body parts with a ZBrush mask by holding Cmd/Ctrl and dragging (if you click Cmd/Ctrl on the left under the brush palette you can change the selection mode). Then extract them, follow the anatomy previously established and stylise the forms if it's needed. For exporting we have to select one subtool; go to Zplugin>Decimation Master>Pre-process All. After that, put the percentage of decimation that you want (you can put a really low value, but make sure that you maintain the main forms).

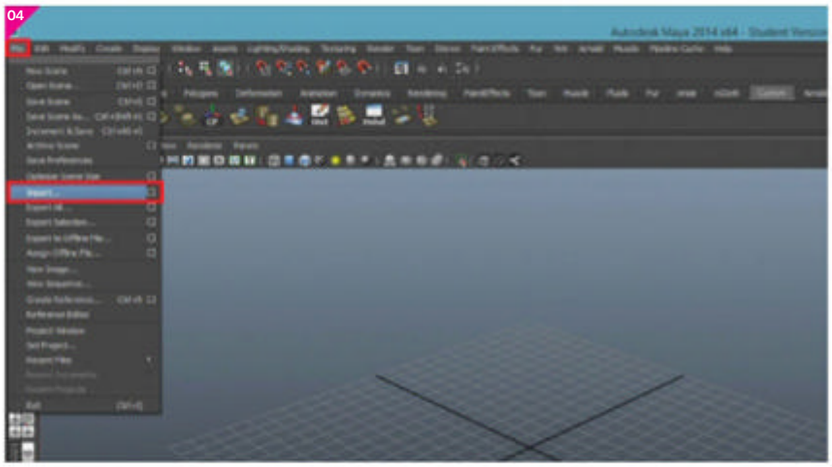
### Don't settle on the design

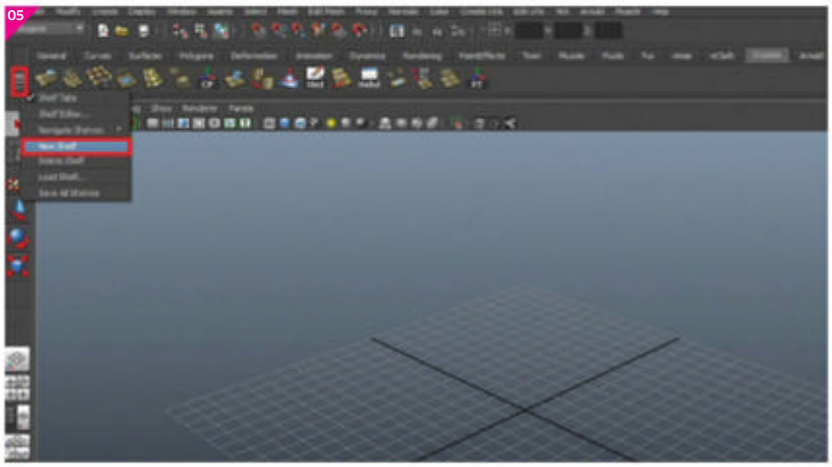
As the initial steps are to design the scene, the characters, and how they are going to fit into the story that you are trying to show, you don't have to focus only on the first ideas that you have. If you come up with a better idea then try it out, and if it works go ahead and use that instead. You keep changing the design and explore ideas until you come up with one you like. I never imagined that this robot would come out as it did. I had an idea, and that idea evolved during the process.

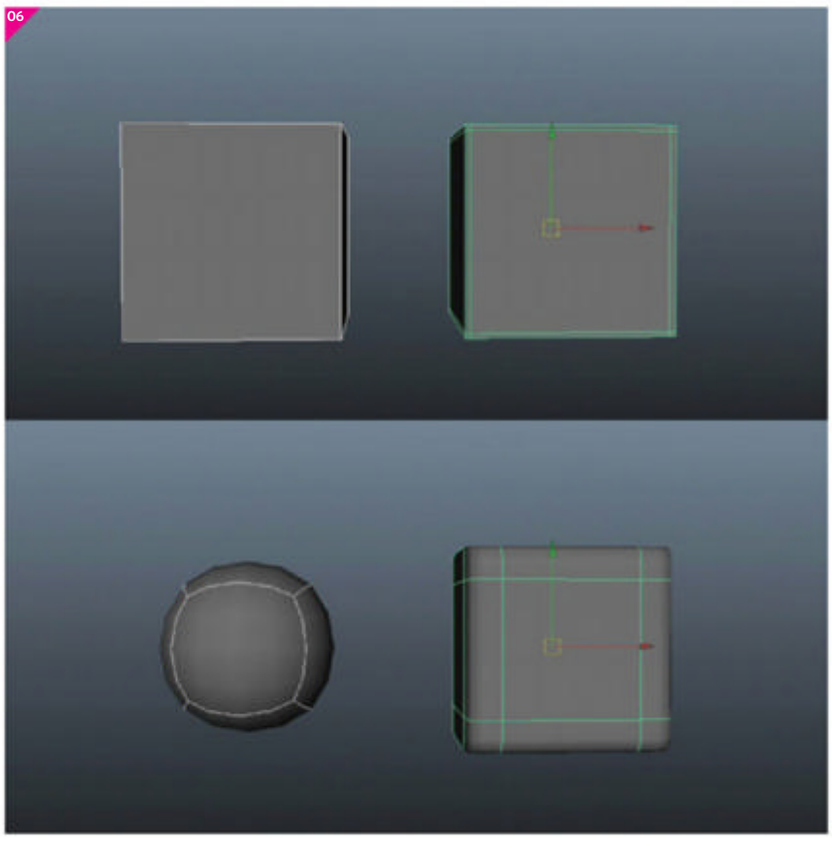



**YOUR FREE DOWNLOADS**
from **filesilo.co.uk/3dartist**

- Video tutorial
- Tutorial screenshots



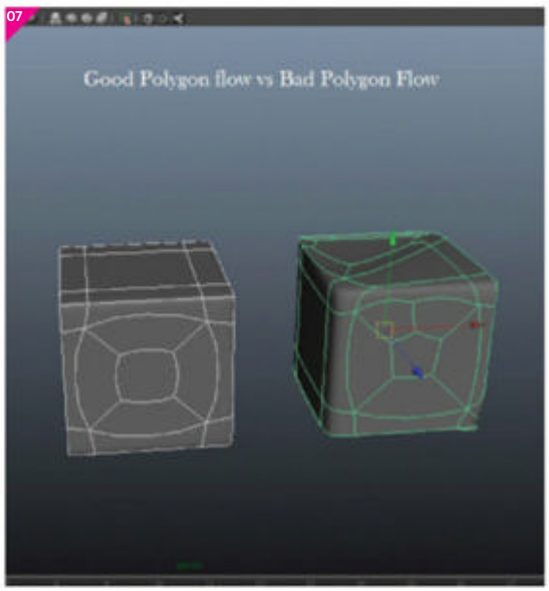




**04 Import our brush base** It's possible for the base mesh to become partially black and white when you import it from ZBrush as an OBJ. If this happens, all you have to do is go to the Polygons menu in Maya, then Normals>Unlock normals. Another problem you might encounter is that the model may be too big or too small. It's no problem, you just scale them up or down until it reaches a normal size. After that, the best thing to do is assign a layer to this base to hide it whenever we want or to make it a reference objects, so that we won't accidentally select it.

**05 Prepare to model** The tools for modelling the mechanical parts are always the same. What we are going to do next is create a custom shelf to get these tools faster. If we click on the arrow icon below the folder icon, you can see there's an option called New Shelf. If you click it, Maya will ask you a name for the new shelf. Once created, you can go to any tool name and click Cmd/Ctrl+Shift and it will add the tool to your custom shelf. The tools that we are going to use the most are: Extrude, Insert Edge Loop, Delete Edge/Vertex Tool, Merge, Duplicate Face, and Split Polygon Tool.

**06 Hard surface modelling techniques** Hard surface is different from organic material. Organic tends to be smooth while hard surface obviously tends to be solid. In 3D this is translated into cuts. If you take a cube and press 3 you will see it that it is almost a sphere, if you start to make cuts closer to the corners of the cube and you press 3, it will maintain the form. That's the basic principle behind hard surface. It's better to maintain all the modelling at quads, but it doesn't matter if you have a few triangles in zones that are not going to deform the geometry. For example, you don't want to have triangles in corners or creases.

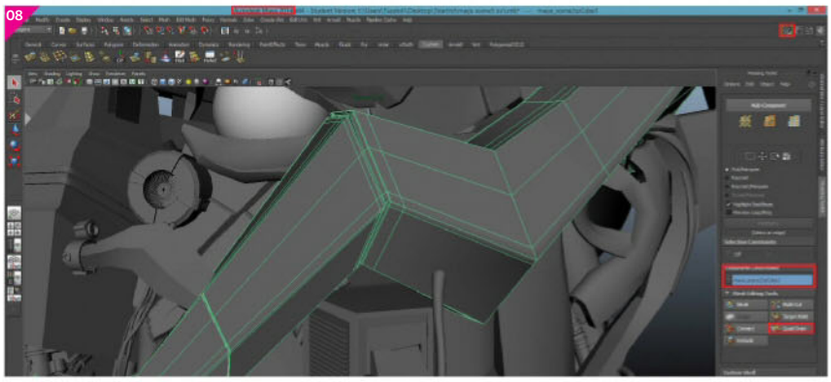


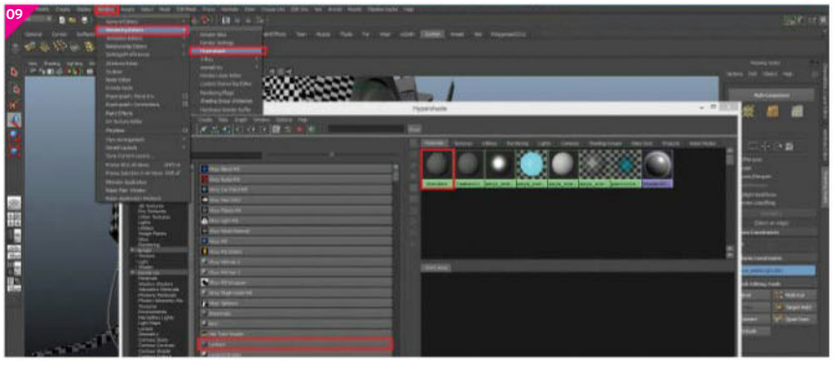

**07 Use topology** For modelling, the best thing to do is model everything in quads because they work smoother and are cleaner to model with. You have to pay attention to the polygon flow because that is how the polygons of the model are flowing. This is equally important in organic modelling as it is in hard surface, although in organic modelling the process is more delicate because it has to have a proper polygon flow in order for the mesh to be deformed correctly.

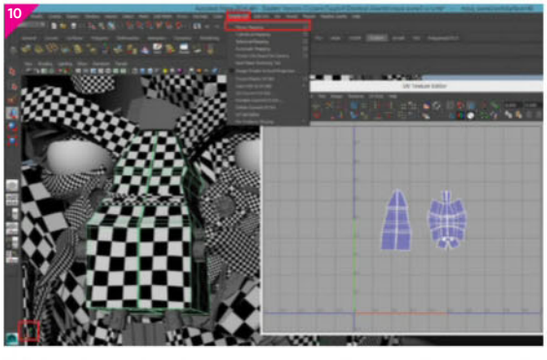
**08 The retopology or manual approach** There are two ways for modelling the robot part in this case. For retopology – in Maya 2014 or in other 3D software such as 3D-Coat – there are tools for this. This approach lets you create the new mesh in the place of the older one and follow the surface. For the manual approach, if pieces are not well defined in the base mesh, then you can do them manually by following the shape by eye, modifying it and giving it details.

**09 Prepare for UV** First create a Lambert material and assign a checker texture to it to evaluate our UV mapping. A good idea is to assign this material only to the piece we are going to do. This is so that we know which pieces have UVs and which do not. Then in the file node of the checker material we set the repetition to something like 50 and 50, so that we don't have to scale the pieces in the UV Editor to change the scale of the texture.

**10 Create UVs** The first thing to do in Maya is to do a projection. We select the piece that we want to unwrap and then go to Create UVs>Plannar Mapping (options). We have to select from camera or from the axis we are in. Then hit Apply, after that you will see that the checker texture in the piece has changed. If we go to Edit UVs>UV Texture Editor, the UV's editor will pop up. Now it's a matter of making cuts where it's needed and going to Tools>UV Smooth Tool and unwrap it.



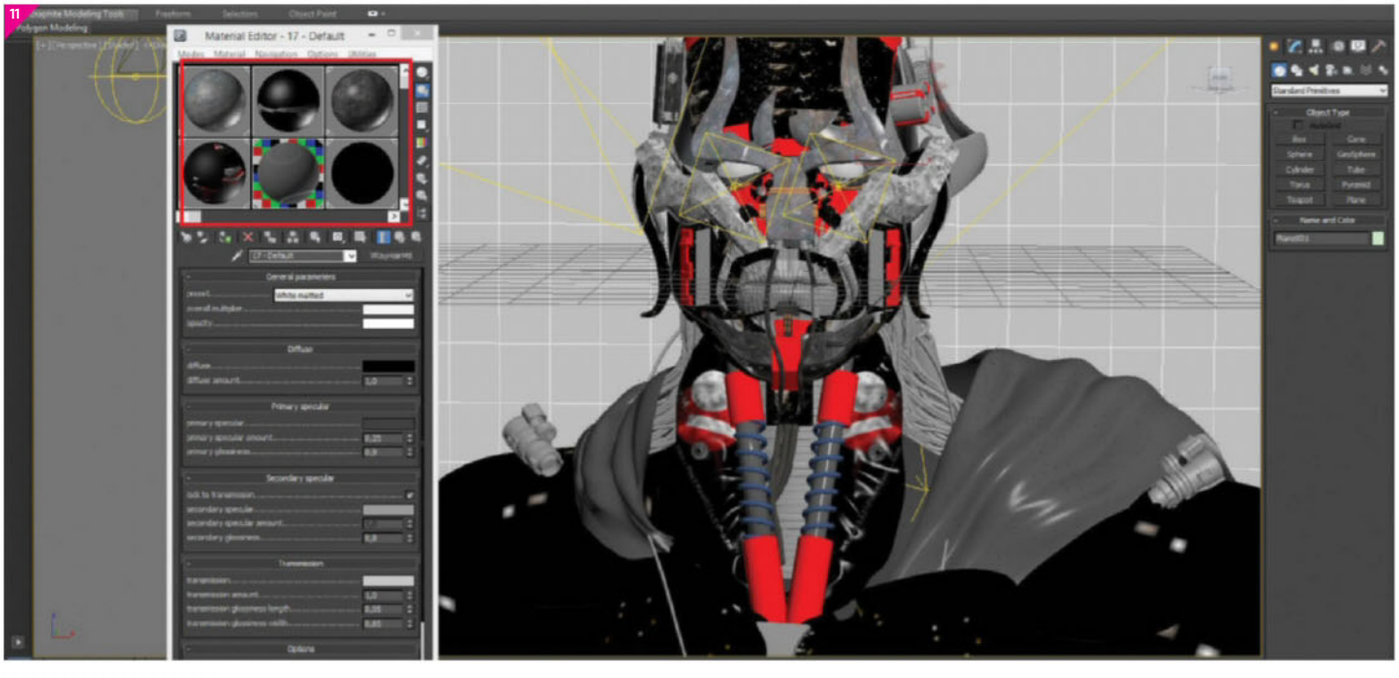



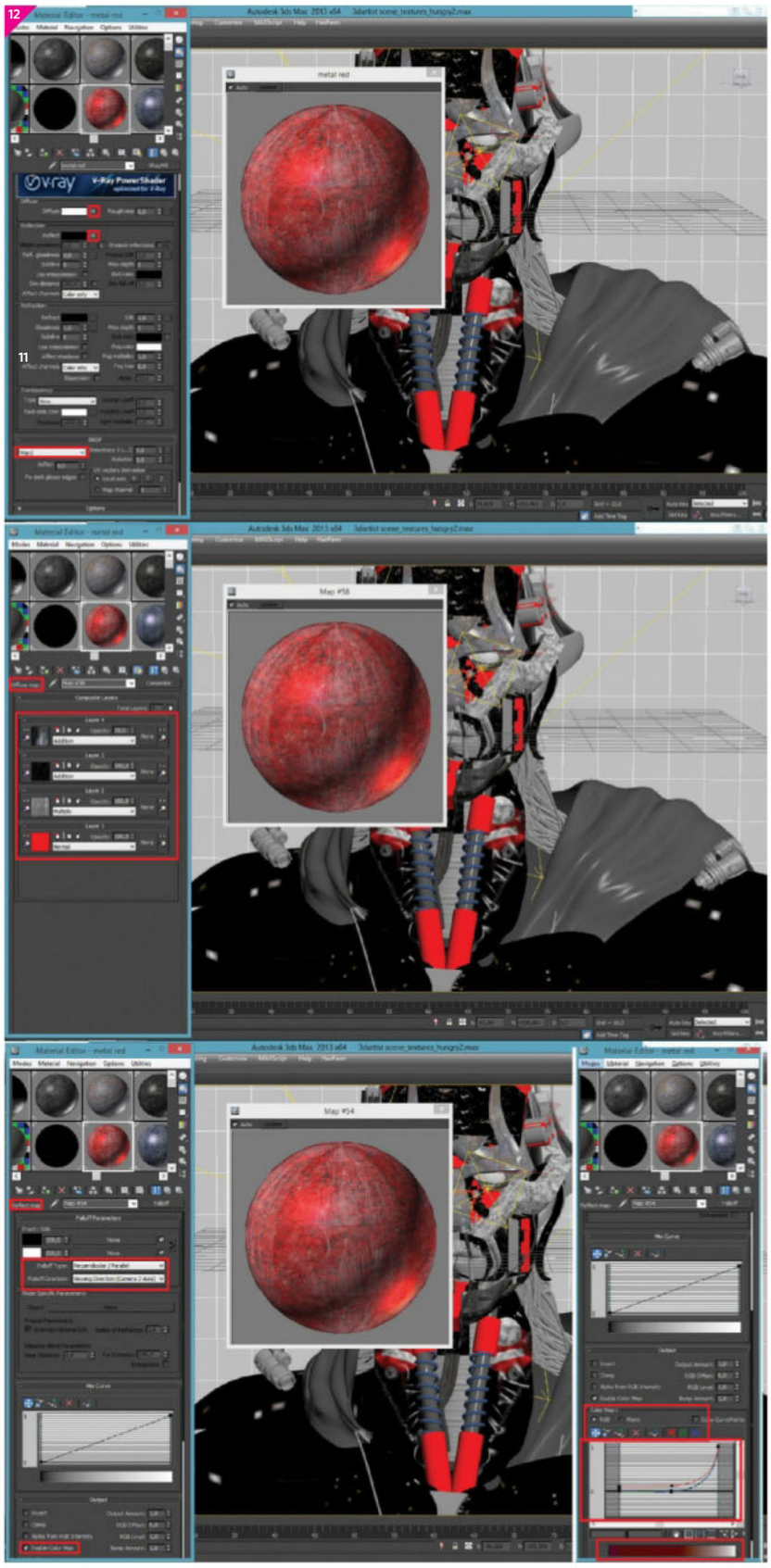




## Concept design

ZBrush is very handy when it comes to designing characters, because at this stage you don't have to worry about topology. So you can pull in, pull out, and move shapes by adding volume and subtracting. You can have a very robust concept and start the final model in hours – this is the power of ZBrush and it's why it's in a lot of studio's workflows.

**11 Define materials in 3ds Max** Once the modelling has finished you can think about which materials we are going to use for the robot, for example silver, gold, steel and so on. This is a very important stage because we will have to define the shading and the textures for each material for a realistic look.



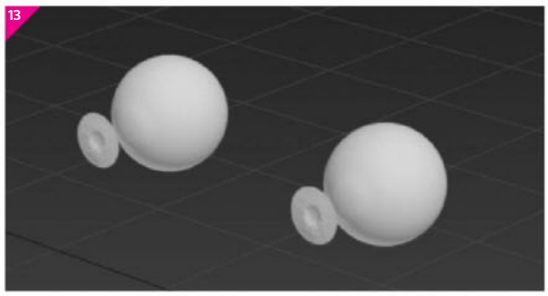


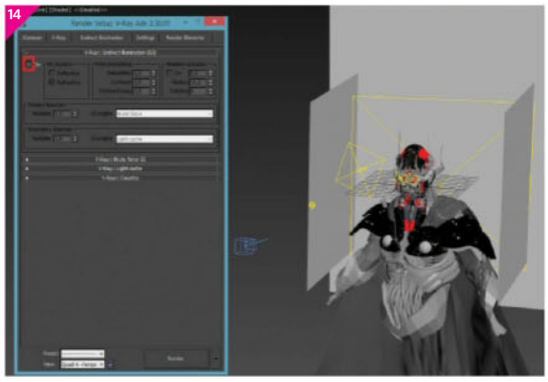
“For the red steel of the robot we used VRayMtl, and for the diffuse we used a composite map”

**12 Steel shading** Here is where we define the behaviour of the material itself. For example, for the red steel of the robot we used a VRayMtl, and for the diffuse we used a composite map in which we utilised different textures from **cgtextures.com**. Once we have the diffuse we start to set our reflections, we have used a falloff map and enabled the colour map in RGB mode to control the Fresnel effect. Because this Material tints the reflection a bit to a slightly bluish colour, we also tweaked the curves.

**13 Eye shading** For the eye we have two meshes: one for the sclera and cornea, and another for the iris. To blend between the sclera and the cornea we used a VRayBlendMtl with a mask. For the cornea we used a fully refractive VrayMtl. For the sclera and the iris, we then used VRayFastSSS2. The mask is a bit blurry so that the transition is smooth. For the lacrimal gland we used VRayFastSSS2 again, and for the little wet line below the eyes we used VRayBlendMtl.

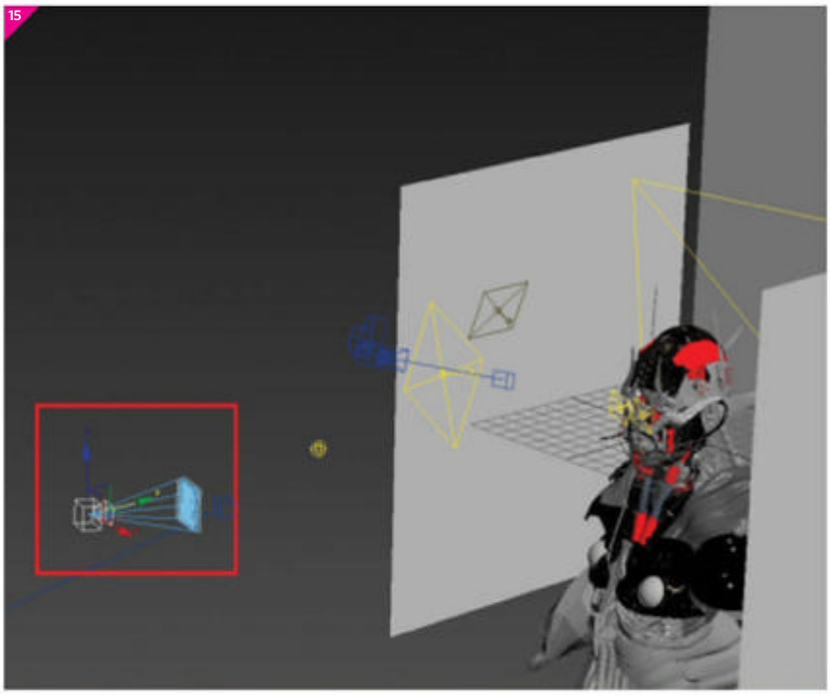
**14 Set up the scene** The scene setup is very simple, we only have two VRayLights and three planes surrounding the robot for the light to bounce a bit. We don’t have Global Illumination turned on since we didn’t need it for this particular render. The final render is at 4096 by 2214 pixels.





## Layered textures

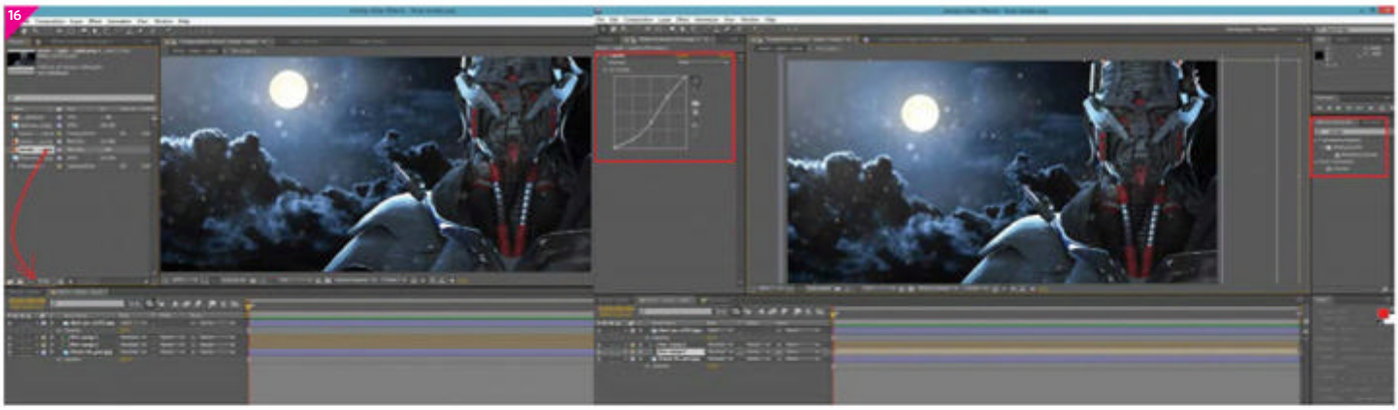
When you work with textures, you can create them in Photoshop, MARI or in 3ds Max as we have done in this tutorial. We didn’t have to export a UV map, we only opened it in Photoshop and then painted above. It was then saved and imported into 3ds Max. But what you can do instead is you can grab some photographic textures and tiled textures from the internet, and then start to build texture in layers. This doesn’t give you total control over the textures of course, but is much faster and the result is not bad for what is needed.

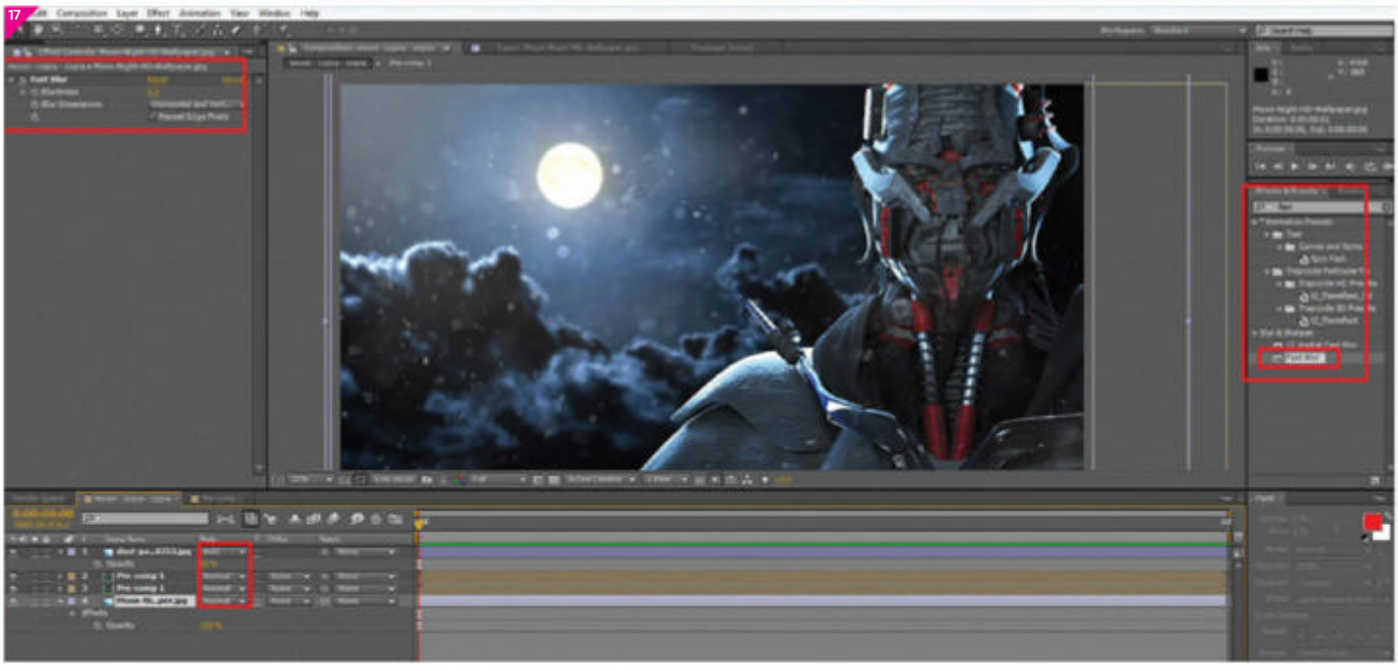



**15 Adjust the camera angle** The last step before the rendering is to decide at which angle we are going to shoot the render. Save the image as a TIFF to get the Alpha channel too because this will end up being handy for us in the compositing part, which will come up later.

**16 Correct the colour** We used Adobe After Effects but you can use Photoshop as well, it's just a matter of personal choice. So, first things first, you have to import the image. Once this is done, import the background as well. After that, drag the render image to the third icon from the top-left render queue. Then drag the background below the render image. Now we will move on to colour correcting, so go to Effect>Colour Correction>Curves and start tweaking until you get a tone more like the background.

**17 Final compositing** Once you have colour corrected the image and it's integrated with the background, you can start to add extra effects like atmospheric dust or particles and lens flares. An important thing to add is a blur for the background. For integrating things together you can play with blend modes like Multiply or Add. For atmospheric dust, it's better to use Add mode and lower the opacity of the layer a bit if you want. Finally, render the image in TIFF mode.






All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

Pixologic™

ZBRUSH®

IDEAS BORN IN CLAY

wwwPixologic.com

www.ZBrushCentral.com

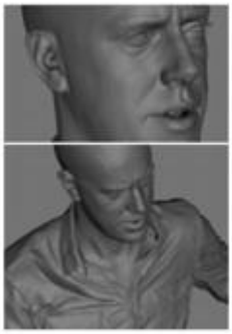
Image Courtesy of Gregory Callahan · www.gcallahan.com

**IAN SPRIGGS**
*Portrait of David Spriggs,* 2014

### Software
Maya, Mudbox, Photoshop, V-Ray

### Learn how to
- Work with photography and image planes
- Create realistic cloth
- Make a realistic skin shader
- Use lighting and composition
- Manage a workflow

### Concept
As long as there has been art, there has also been portraiture in the world. Portraiture provides a window into the personality of the sitter through the composition of the image, the facial expression, the pose and the style.
My goal is to demonstrate how current digital methods that combine photography and painting can be used to produce an image that resonates emotion and life.



# Create stunning digital portraits

## Make an image in the style of Renaissance painters that shows soul and emotion, but also sheds new light on digital art

A portrait is not just an image that is technically correct, it is an image that accurately portrays the subject too. In this tutorial we will show you how to create photorealistic 3D portraits using Maya, Mudbox, and Photoshop. I will explain the importance of using good quality photos as reference and understanding the anatomy of the body, as well as the composition and lighting. Additionally, we will cover some methods of using nCloth, creating shaders and teach you how to use cameras. Creating interesting portraits is a long process that requires a lot of back and forth. A realistic portrait requires patience and a good eye. It is important that you take the time to do each step correctly and ensure that if something doesn't look right, you go back and fix it until it looks right.

**01 Get inspired** In order to create a realistic portrait, you need to start by finding your inspiration. Our inspiration for this tutorial comes from the Renaissance art movement, from painters such as de Goya, Rembrandt and Caravaggio. These masters were able to see the world in a way that others did not. They were able to capture their vision in artwork that, centuries later, still leaves viewers marvelling. Begin by gathering images that speak to you and try to understand what it is specifically about them that you like. Is it the lighting? The colours? The composition? The overall mood? Ask yourself, why was this piece created? Why did the artist use certain colours, angles, contrasts and brush strokes? Once you find an image, always refer back to it, but don't try to copy it.

02

**02 Reference photos** Once you have chosen your subject, you will need some good photo references for the modelling and texturing process. We have two different photoshoots, one for the pose and one for the texturing. Set up a space with white walls and plenty of light. Choose a natural pose for your subject, something that also brings out their character. Afterwards, take photos for the textures. This requires good lighting, no shadows and no hotspots – you want the subject to be as diffuse as possible. You will need a full rotation, one shot every 30 degrees, with the subject in a straightforward pose. You will also need photos of the subject looking up, left, right and down; close up of the eyes, ear and hands; and one with the eyes closed. Working with a high-focus length creates less perspective, which can be easier to work with when sculpting. Once you have downloaded the photos, work with the RAW files. Adjust values as needed to bring out the details and remove some of the shadows.

**03 Image planes and base mesh** Choose the master photograph, the one that has the right pose and expression. This will be your main reference throughout the process. Check the focus length under the metadata of the image. Always ensure that your camera in Maya, Mudbox, or ZBrush matches the focus length of the photograph, otherwise the perspective will be off and it will be impossible to get a correct representation. In Maya, create a camera, fix the focus length to match the photograph and import that photo as an image plane. We are working with a pre-existing base mesh that has been set up with a simple rig for quick posing. The model has been matched as closely as possible to the photo, then the camera has been locked so it cannot be changed. From this point on, this photo and camera can be the control variable. You can change the camera later once you are working on the composition while creating the model. Now you need a solid base to work from.

03

### The art of patience
Creating portraiture is a long process, it is a lot of tedious tasks that are each just as important as the next. Never lose focus of the image as a whole. Things won't always work out and it is worth having the patience to go back and fix it. Take the time to get effective groundwork, good photo references and even getting some books on anatomy. Even though you might think you are down to the last ten per cent of the piece, it will probably take you 90 per cent of the overall time to finish.

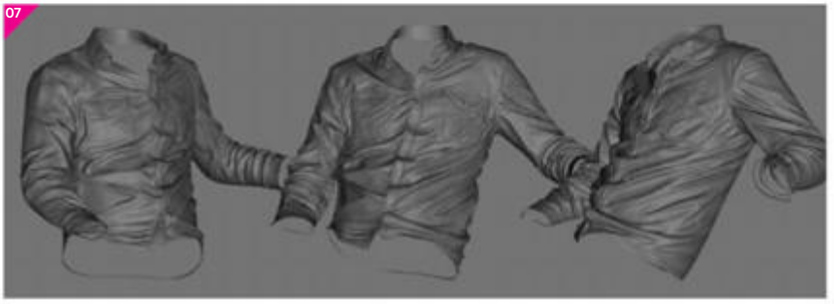
**YOUR FREE DOWNLOADS**
from **filesilo.co.uk/3dartist**
- Tutorial screenshots

> The hardest part about making a portrait is that you can't work in real-time with the final render

**04 Block out and add cameras** Once you have blocked out your model in reference to the photo, you will need to bring in more cameras to double check your proportions and angles. Try to get the head lined up as closely as possible. It may be hard to match the cameras up perfectly, so go back and change them once in a while. This requires a lot of back and forth between changing the model and the camera angles (though these are never locked down). These cameras are going to be the cameras you import into Mudbox or ZBrush, and the Maya camera and Mudbox camera will be in sync. The hardest part about making a portrait is that you can't work in real-time with the final render. You can sculpt but you will not have a true representation of what the final render will actually look like. Having cameras synced throughout each program will enable you to take test renders at anytime during the process and compare them directly to the photographs that you have as reference. You want your final render to reflect the original photo and the only way to do this is to make sure that each step along the way is a perfect representation.

**06 Match the eyes** The eyes are the heart of a portrait. The slightest change to the eyes will make the subject's expression change. Take the time to properly block out the anatomy and match it up with the photos. Be warned that no matter how much time you spend working on the eyes at this point, you will have to come back and change them once you start texturing and lighting. Beginning at a very early age, humans learn the subtleties of facial expression, much of which revolves around the eyes. Even someone who has not studied art or anatomy will notice right away if they are wrong. When creating a portrait you should spend the most time working on the eyes since this is what really brings a model to life.

**05 Start the model** Beginning the process of working on the model can be challenging, even with good photo reference. You have to be patient and pay attention to every detail and knowing the anatomy for modelling is a must. Do not guess at anatomy. Make sure that every part of your model is intentional: every bump, every wrinkle, every muscle and every fold must make sense. There are many books and courses on anatomy out there and even if you think you know it, there is always more to learn. Start by blocking in the overall shape in Mudbox. Keeping in line with the photo reference, go through each camera, matching it closely. It is easy to get caught up in the details at this point, but try to keep working on the model as a whole. Do not work in sections at this point. Focus on making the proportions correct and placing the eyes in the right spot by looking at the photo reference and sculpting in the anatomy. There will be a lot of information that is hard to understand – use your knowledge of anatomy to fill in any unknown parts. Anatomy remains the same for everyone just with changes in proportion. Once you have blocked most of your model, start working in smaller and smaller sections, leaving fine details until the last moment. Never, at any point, lose focus of the overall shape.




**07 Create clothes** For the clothes, start by making them on top of the T-posed original base mesh. Build them to a low-resolution mesh that you are happy with. Then make a blend shape from the posed character model to the T-pose model, and wrap the clothes onto the body and turn off the blend shape. The clothes follow the mesh into the posed shape. With a little clean up, the clothes are a good base for adding the details. This process can be easier than making the clothes asymmetrical on the posed model. You can add a cloth simulation on the clothes using nCloth, which is pretty good for getting basic shapes and forms in, but not for a high level of detail. When sculpting the clothes pay attention to the form of the body underneath. Even though you will not see the body itself in the final render, it is important that you know its form since the muscles might create stretches in the fabric. To create a highly realistic model it is essential that the clothes interact with the body, which is what causes the shapes, the folds and the stretching in the fabric.

**08 Work on the details** At this point the model should be coming together and it is time to start adding the small details. Detail is what creates a true feast for the eyes. Even if the viewer is not actively aware of observing particular features they will notice if there is a lack of detail, since it's the detail which adds that extra layer of realism. Be careful not to overdo it however, as you may end up drawing attention away from what you really want the viewer to focus on. In our portraiture work, the main focus is on the eyes and face. Everything else, like the detailing and the background, are meant to showcase and support these elements. If something is distracting and takes attention away from what is important, then get rid of it.

**09 Texture by hand painting** Texturing involves projecting the photographs you took onto the model. We have used Mudbox to project the images. All the cameras that were previously lined up with the model during the modelling stages can now be used to project the images onto the model. Do your best to make sure that there aren't any stretch marks and use as many cameras and images as needed to check this. It will take time to make this look right and it will require a lot of hand painting to make it seamless, too. Do not paint in textures of any shadows or highlights as you will want the skin to be only diffuse at this point. You may have to go back and change the UVs as they may have been laid out incorrectly the first time round. At this point, you will be glad for all the work that you did earlier on to ensure that you had a good photo reference before starting.

**10 Move on to texture maps** To create the other texture maps you need to use the Diffuse map you painted. Start by desaturating the Diffuse map to create a base for the Spec map. You will have to add some white to the wet parts of the face, such as the lips and tear ducts, to create a higher spec. Look closely at your photo references to see where exactly the white is needed on the face, then create the Gloss map using the same process as above. To create the Bump map you can create a High Pass in Photoshop. Do these maps quick and dirty to begin with to get to the process of the test rendering stage as soon as possible – these maps will change no matter how much work you put into them at this stage so don't worry too much. Note that you may need to change the Diffuse map many times throughout the process, which means that these maps must also be altered to match. Once the Diffuse map is finalised you can then start really polishing out the others.

## Timeless art

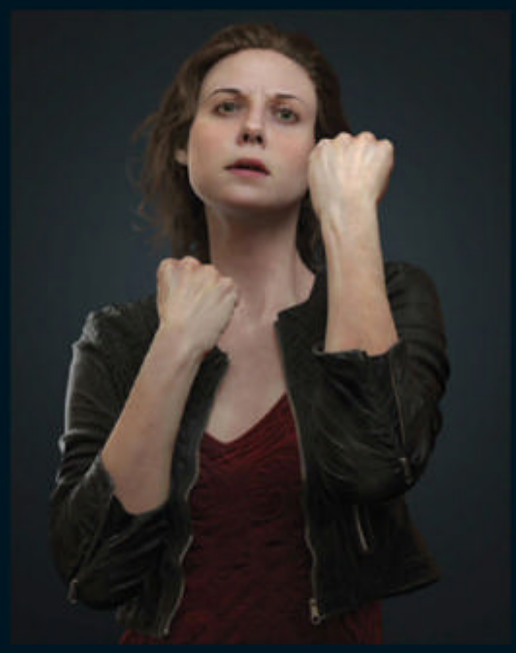
Using digital and 3D methods to create images can cause work to look dated quickly since digital technology evolves at such a rapid pace. By creating portraits inspired by the art of the Renaissance we are trying to limit this effect. Renaissance portraiture brought to the genre a new level of balance, harmony and insight, as well as greater realism made possible by the use of oil paints. Digital methods helps to create new ways of seeing, and it is important to utilise these methods to achieve the new Renaissance of portraiture.
Since it can be hard to keep up with the technological revolution I focus first and foremost on the artistic aesthetics of an artwork. I strive to make 3D works not appear 3D so that the work is timeless.

# Showcase

## Ian Spriggs

I am a 3D character artist and I studied Fine Arts and 3D animation. I live in Vancouver, Canada and I am working in the film industry creating character models. I've worked on film titles like *RoboCop* and on *Warcraft* with Industrial Light & Magic.

***Self-Portrait*** **Maya, Mudbox, V-Ray, Photoshop (2014)**
My self-portrait was the first in my series of portraiture work. With this piece I wanted to create an image that reflects my personality and artistic style.



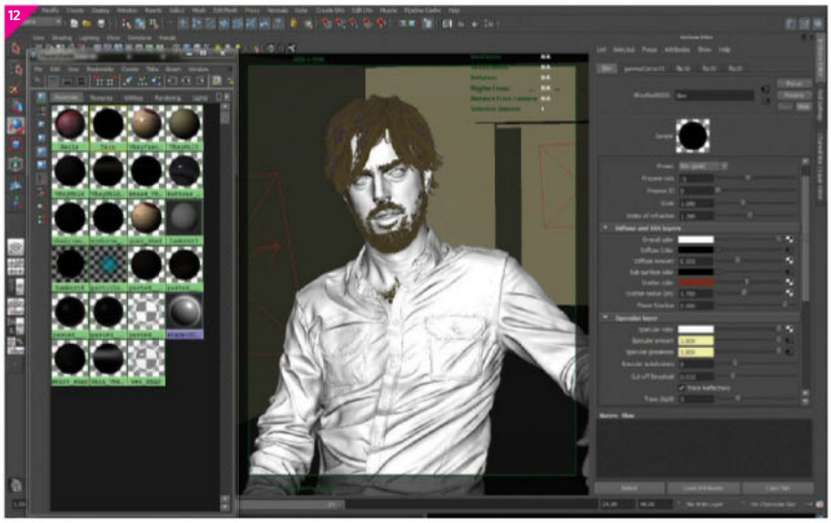
***Portrait of Heidi*** **Maya, Mudbox, V-Ray, Photoshop (2014)**
In this portrait I wanted to portray strength and attitude, with a contrast between threatening and non-threatening.

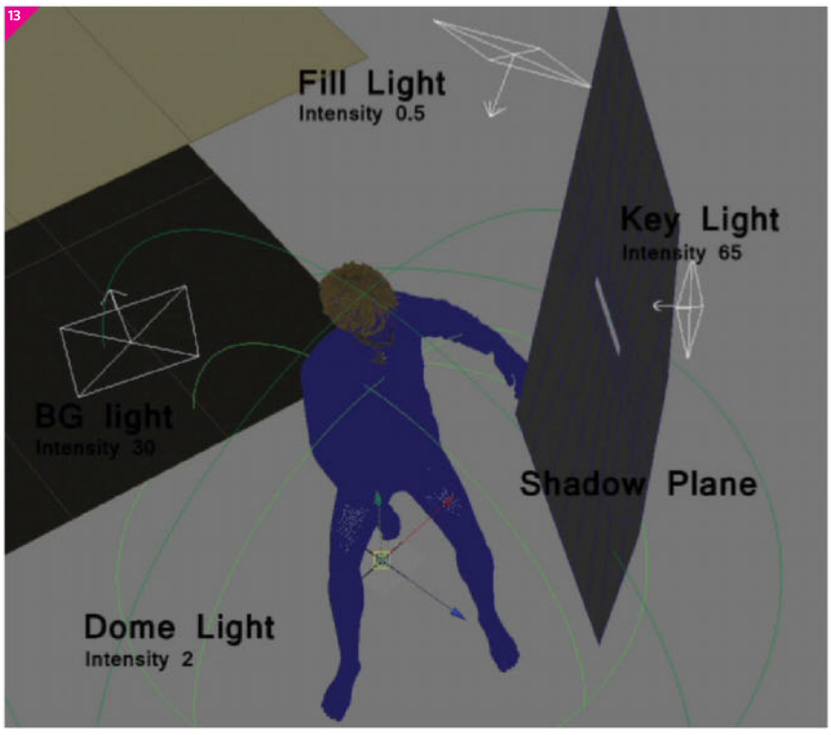
**11 Create the hair** The hair is definitely a challenge and will take time. There are many ways to make hair and you will have to try different methods until you find the one that works best for you. The way we've done it is by creating NURB curves following the photo reference, duplicating each one and having complete control over each. Then convert these to nHair and add a V-Ray hair shader. Next, adjust each hair separately to match the photo. This is a tedious task, but it is important that the hair perfectly matches the photo reference of the subject. Creating hair for all places where there is hair on the subject (like the eyebrows, arms, beards and armpits, for example), will yield the most realistic results.

## Train the eye

Everyone knows what a face looks like. You can close your eyes and see it perfectly in your mind's eye. Sometimes we use our mind's eye rather than photo reference when modelling. The problem with this is that often, what you think something looks like is not at all what it really looks like. If you want to create a realistic portrait, you cannot simply rely on your imagination. You have to train your eye and be willing to see what is in front of you in order to create an accurate representation of your subject.

**12 Use shaders** Once you have brought your textures to a comfortable level start to add them to the shaders. For the skin shader we used the VRayFastSSS2. Start with the pink Preset setting and add maps to the Diffuse, Subsurface colour, Spec, Gloss and Bump. We don't need a Displacement map as we are rendering the hi-res object. We are constantly changing the model and need to make quick changes so when creating shaders, take a test render before adding another map to see exactly what you are doing. It may be handy to place the shader onto a sphere and render it next to the model. Sometimes the details on the model can cause confusion as to what is actually happening and doing this just simplifies it.




**13 Light with V-Ray** For this portrait, we used VRay Dome Light with an HDR, a key light with a plane in front to create the shadow on the subject's face, a fill light from the right, and a light to fill the background. It is important to watch for any areas where the light gets too hot as this makes the image appear less realistic. The lighting is key to creating the mood of the piece. The difference between a soft fall-off light and a hard light can change the mood entirely. The work of Caravaggio is a perfect example of how a hard light can change an image. Caravaggio's work is high contrast, which makes it more dynamic, whereas Rembrandt uses a softer light to give his work warmth. Test out different styles of lighting from a variety of angles. Save a new file each time you do a render so that you can always go back to the one you like best.

> You can add a cloth simulation on the clothes using nCloth, which is pretty good for getting basic shapes in

**14 Test render** The only way you that will have any idea what your final image will look like is by testing. Next to the eyes is where we will spend the most time. Usually by the first test render you can see a lot of things that need to be changed. You may need to go back and change the model and all the texture maps. This is the point where you can finally begin to work on everything all at once – it is the most frustrating part of creating the image. Take the test renders to Photoshop and do some draw overs, colour corrections and lighting changes. Then go back to make all the corrections. Make sure that you are constantly comparing the portrait to the photo references and art reference.

## The human face

I believe in creating art that expresses your experiences. My work is constantly gravitated to the human face; it is perhaps the most difficult form to represent as it contains emotion and personality. Every face is different.

**15 Get new eyes** It is essential that you take a fresh look at your image – this is the easiest way to notice anything that may be wrong with the image. There are a couple of ways to get new eyes on the work. One is to make the image black and white because the colour can distract you. Also, try playing with levels in Photoshop and go to the extreme with this. Find out where the hotspots are, and see if they are where they should be. Flip the image and right away you'll notice if the composition is off. Do something radical with the colour levels. When you come back to the original levels you might see that the colour needs slight adjustment. Lastly, get someone's feedback and ask them to be critical. They will likely spot things that you have missed.

**16 Final render** Your work will never be complete, there will just come a time when you stop working on it. When rendering the final image, make sure you have all the passes that you will need for the touchups in Photoshop: Diffuse, Specular, Reflection, Z-depth, a multimap for the body, raw lighting, Bump Normals, and the Alpha. Having all the passes you need will enable control and the option to make any changes that you want to the final image. Even if you do not make that many changes, it is better to have these passes than not. Double check that all the lights have a good amount of samples so that there is as little noise as possible while maintaining a good render time. If you plan to print out your image keep in mind that most printers require 300dpi. It is better to render out larger otherwise your image will print much smaller than you thought. We will be rendering with a height of 5,000 pixels.

**17 Touchups in Photoshop** Now take all of the renders into Photoshop. Having rendered out a couple of different passes we are able to bump up the spec in parts, add Z-depth, and make any colour corrections as needed. Add a little warmth to the colour of the skin. Go back to the eyes and touch them up again – creating a realistic reflection is important. We can never get the results you are after in the render, so do this in Photoshop. It's important that the background complements your model but does not stand out too much. The CG world will be one of your biggest critics and nothing will go unnoticed. Take time to go over the entire image to make sure that you haven't missed anything.



All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

ImagingInsurance

# The right insurance for YOU?

With a full range of specialist policies for Photographers, Video-makers, Film Processing Labs and everyone involved in Image-making, Imaging makes insurance simple, effective and hassle free.

Imaging strives to give you excellent cover, service, security and value for money.

For a quote or more information, call Imaging Insurance now on...

**01277 243016**

Or visit our website...

**www.imaginginsurance.co.uk**

Imaging Insurance is a trading name licensed to Vantage Insurance Services Limited (VISL) by Niche Insurance Services Limited.
VISL is authorised and regulated by the Financial Services Authority. VISL is registered in England, No 3441136.
VISL's registered address is: 5th Floor, 41 Eastcheap, London, EC3M 1DT
Imaging Insurance can be contracted at: 2nd Floor, Juniper House, Warley Hill Business Park, Brentwood, CM13 3BE
Tel: 01277 243016, Fax: 0207 6558060, Email: info@imaginginsurance.co.uk



*Redefining workstation graphics performance*

AMD FIREPRO

SAPPHIRE
Professional Graphics Solutions

**Media & Entertainment**
AMD FirePro™ graphics are designed, built and thoroughly tested by AMD for creative professionals in the media and entertainment industries.

**ISV Certifications**
AMD FirePro™ graphics feature a **100% success rate** on first pass certification on known applications.

**Rock Solid Drivers**
AMD FirePro™ drivers are **Rock Solid** and certified with major media and entertainment applications.

**Reliability**
Every AMD FirePro product goes through **four** full rounds of quality testing, ensuring a robust, reliable hardware solution.

**AMD FirePro™ W8100**
-4.2 TFLOPS of compute power
-8 GB of Graphics Memory
-320GB/s memory bandwidth.

**AMD FirePro™ W7100**
- 8GB of Graphics Memory
- 4 x 4K displays per card
- Equipped with 1792 cores

**AMD FirePro™ W5100**
- 4GB of Graphics Memory
- 4K support
- Quad-display connectivity

**AMD FirePro™ Resellers**

RENDA PROFESSIONAL WORKSTATIONS
www.overclockers.co.uk/renda

Workstation Specialists
www.workstationspecialist.com

ARMARI
www.armari.co.uk

VOYO TECH
www.yoyotech.co.uk

SCAN computers
www.scan.co.uk

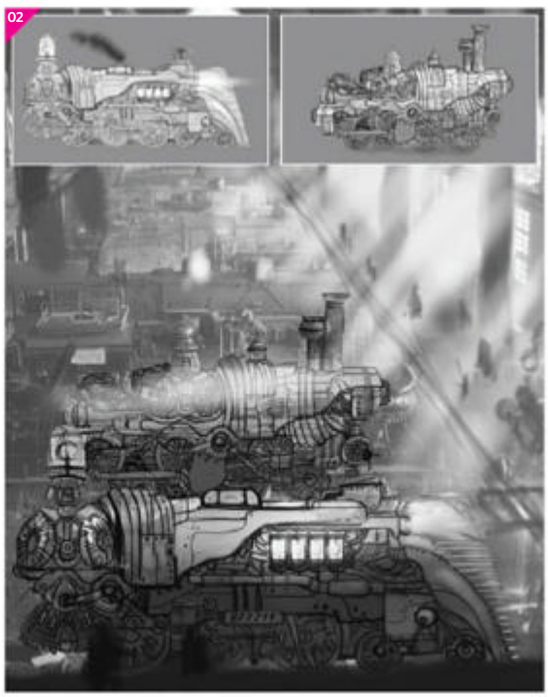
DANGER

# Model a steampunk world in Blender

## Build a beautifully bizarre crossover world that juxtaposes factories with cathedrals, steam with electricity, and fits right into a steampunk universe

Have you ever struggled with translating the fictional world from your head to canvas? Have you spent hours in Blender just to realise that the result has nothing to do with your envisioned world – be it steampunk, sci-fi or fantasy?

This problem is quite common when starting a project, but there is a better workflow to get things done. We will capture the world and translate it to Blender so others can see it. In this tutorial we will discuss various stages of creating a steampunk scene that will feature an epic cathedral, Tesla-style locomotives and lots of other fictional and beautiful goodies. We are going to be going step by step through preproduction, blocking out the main shapes, going straight to detailing, setting up lighting and later, move on to matte painting. We'll learn the main principles behind an efficient 3D workflow. The aim of this tutorial is pretty straightforward – to help you cross the gap between imaginary worlds and a real canvas. We will accomplish it by studying what works and what does not when dealing with millions of polygons and some electric trains.




### Build composition around just one principle

You can build the composition around one simple principle. Rhythm? Symmetry? Maybe even balance? Strong composition can be simple. As we know, creativity blossoms under the constraints. By constraining our focus to just one thing, we generate a lot of ideas around that one thing. So many paintings are based solely on the idea of rhythm and look gorgeous. That focus can help you to find the right composition early on and stick to it through the modelling process.

**01 Get inspired** What is the point of rushing to work if you aren't excited by an idea, image or world? Start the ball rolling by surfing through dozens of images, related to the initial idea. Open Flickr or Pixabay and start searching. Anything goes; we're going to create a steampunk world, so begin by looking for old locomotives, factories, stations and whatever else comes to mind, but of course remember to search for 'steampunk' too! Save or bookmark every image that grabs your attention. After you've picked the images that resemble the initial idea in some aspects, the next step is to come up with a mood and style of your steampunk world. Look through the references that you've compiled. We've used an endless set of factory windows with light streaming in, station ceilings resembling cathedral nervures and locomotives covered with fuel oil. Try to find what works for your setting. For example, we've got a strange hybrid of public and sacred: a factory merged into a cathedral with Tesla trains, driven by electricity – who said we can't take steam out of the equation? Your solution will be different so take your time and try to feel the style and the mood, before moving on to sketching.

**02 Establish the composition** By now you should have some understanding of your world even if they are binary opposites: like and dislike, fits and misfits or relevant and irrelevant. Armed with this knowledge, you may try to create a base for your composition. This is going to be the first time you need to open image editor and actually tweak something. If while gathering images you spotted an interesting compositional idea among other things, fine! You may then want to build your composition around that idea. For example, our composition was strongly (and we mean it – strongly) influenced by the railway photos of Jack Delano, a photographer who was from Chicago. That was precisely what was needed – an endless row of locomotives and an endless row of windows that illuminate them. That locomotive depot could be transformed into a steampunk temple quite easily. We can see that it works after sketching over that photo in Photoshop. After you decide on a composition, stick to it.

**GLEB ALEXANDROV**
*Station 45,* 2015

### Software

Blender, Cycles, Photoshop

### Learn how to

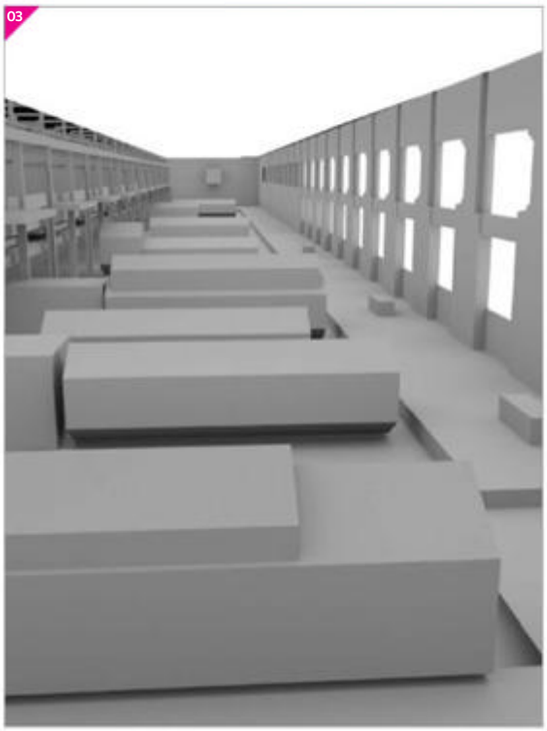
- Develop an idea and style of a fictional world
- Model complex 3D structures efficiently
- Set up lighting with dozens of light sources
- Enhance a final composition with a matte painting

### Concept

The concept of the artwork is heavily influenced by the railway photos of Jack Delano. In my point of view, rhythm and lighting of his photos are just too awesome to pass by and not get inspired.

**YOUR FREE DOWNLOADS**
from **filesilo.co.uk/3dartist**

- Timelapse video
- Tutorial screenshots

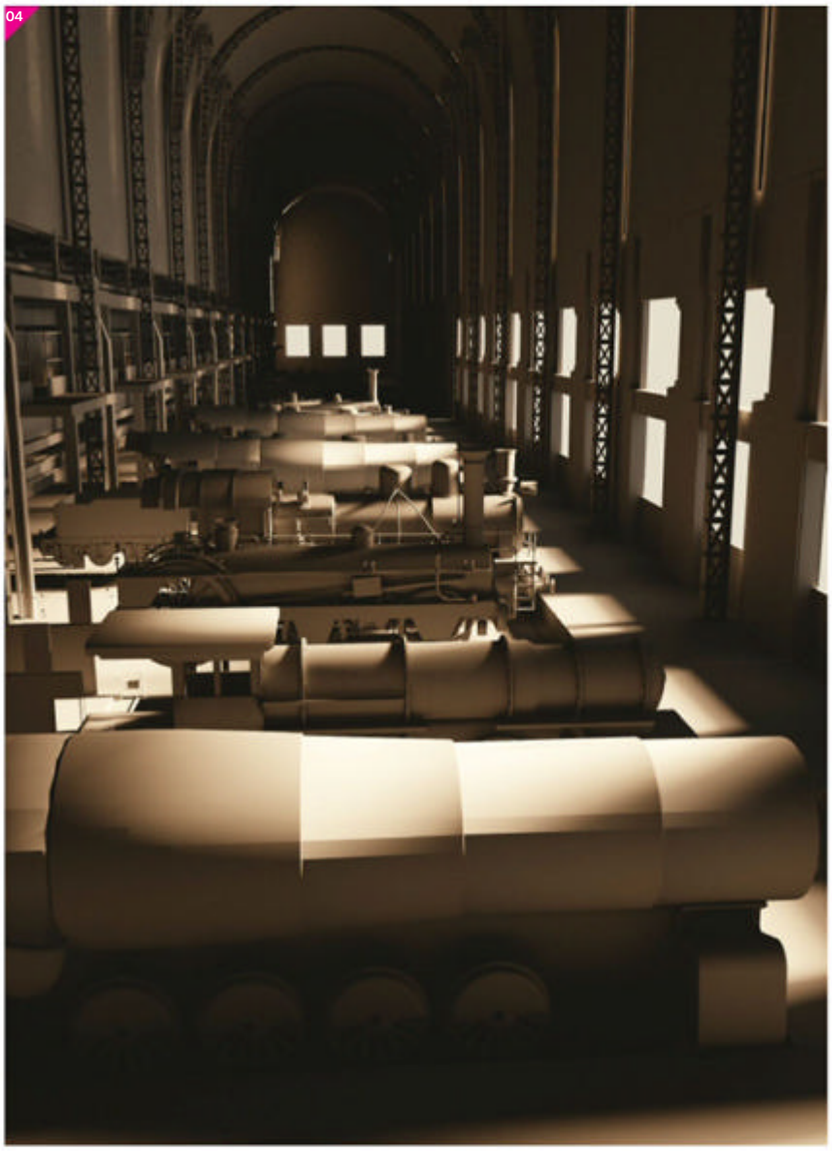


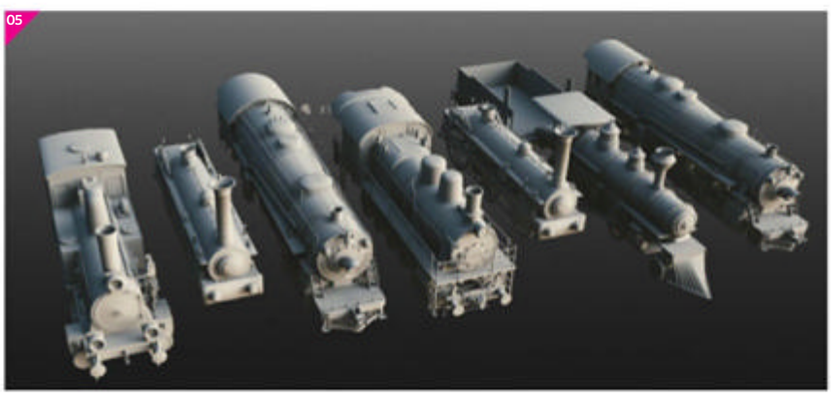

**03 Block out the base** Hopefully, you will have a sketch by now. Open it up in UV/Image Editor and make sure that all of your references are nearby, as you will be needing all of them. Start by blocking out the main shapes of the level, using nothing more than boxes and planes. Simplify the shapes as you go and don't get distracted by the finer details. Use copy and pasting tools extensively: array, mirror and, well, copy and pasting objects by hand. The goal is to move quickly through the blocking phase, then set up the basic lighting and check if the composition falls apart. So, after you have achieved a *Minecraft*-esque representation of the world, immediately move on to the next step.

**04 Establish a key light** Let's establish a key light source to evaluate our composition and change it if needed. Create the sun lamp and find the interesting light and shadow pattern by rotating it. Emphasise the focal object. The whole point of this stage is to test your composition one last time, using 'real' geometry, correct perspective and lighting. Chances are, after illuminating your scene you'll see the epic flaws in your composition and will be forced to rethink it. Don't worry, it is completely fine to change something now. For example, it is okay to balance the scene by adding some big shapes. Or just crop the image differently.

## List of downloads

Steam locomotive by mazvi, used under CC BY **www.blendswap.com/blends/view/6879**
Steam locomotive - DSB litra F by TomSorensen, used under CC BY **www.blendswap.com/blends/view/74375**
Locomotive by dreadbwai, used under CC BY 0, public domain **www.blendswap.com/blends/view/41064**
Steam Truck Allchin by BobReed64 used under CC BY 0 **www.blendswap.com/blends/view/63762**




**05 Build or find more elaborate assets** Let's pretend that the previous two phases of our workflow went smoothly. Composition works well and it is obvious to you and your family or friends (getting feedback is necessary). The rest of the modelling process is straightforward. We swap our *Minecraft*-esque boxes with high polygon counterparts. Try visiting Blendswap (www.blendswap.com) – a brilliant resource of free 3D models – and look at what it can offer. The modelling process gets so much easier when you aren't starting from scratch. So download everything relevant: locomotives, generators and other weird mechanical assets, upon which you will build the bulk of your scene (but note the licence type).

**06 Save time** When dealing with complex scenes, it's advisable to use every possibility to save time and not repeat tedious work over and over again. So if we need to create ten locomotives, what shortcuts can we apply? Mirror modifier makes only half of the model and mirrors the rest. With group instance we can group a few objects, then copy or paste it. The benefit of such a setup is that we can make changes to the original group (for example, add some objects), and the group instances will update automatically. Then there is the Array modifier. For example, make the section of the wall with one window. Duplicate this a few times to form an array. See the pattern? Do what must be done to save time, and copy or paste everything else.

## Don't stop sketching

Regardless of where you are on a project timeline, you might need some additional sketches of the foreground machines and the hero vehicles. Don't be afraid to spend time sketching. Return to image editor, Google the references and go back to the basics. You can start preproduction in the middle of production when it's needed. In other words, it's always a good time to turn the workflow inside out and start painting new sketches for some piece of steampunk machinery.

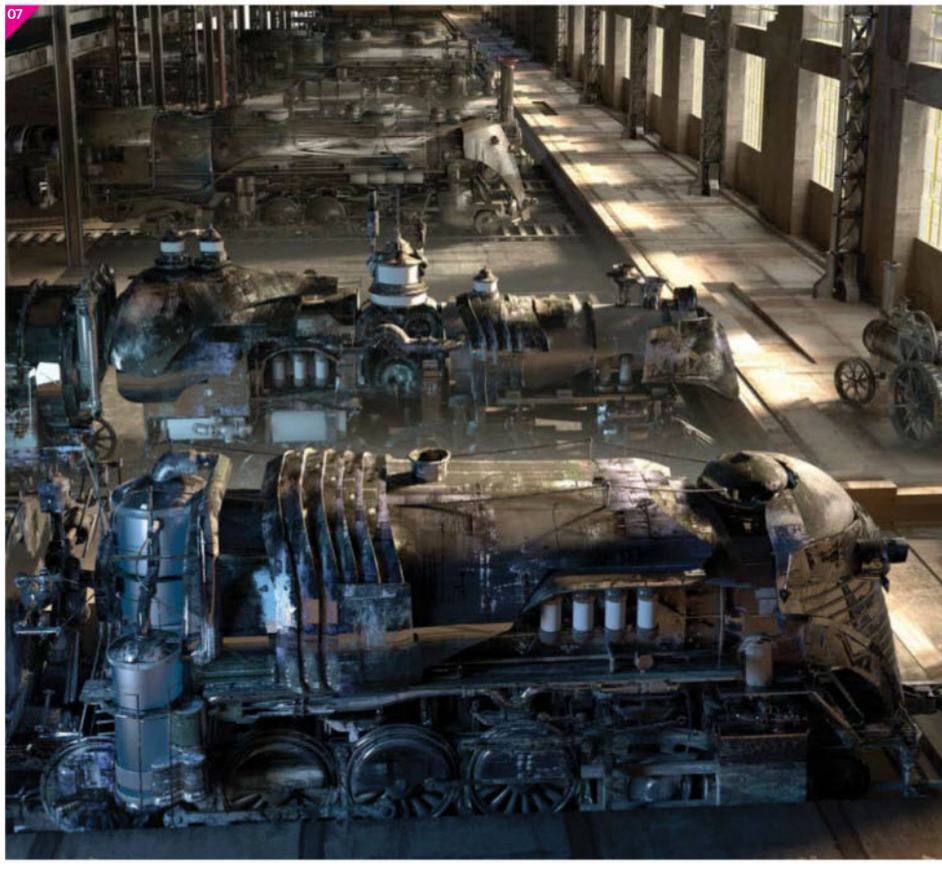
**07 Use two-point lighting** Without light, there is no vision, photographers say. Indeed, what is the point of modelling such a complex steampunk world if you don't show it off with great lighting? Especially if this world is full of electricity-driven devices because that's a natural setup for awesome illumination. Go ahead and set up a key and fill light – the basic pair and the so-called two-point lighting. As we have created dominant light early on during the blocking out stage, all we need to do now is to create an ambient light to fill in the dark spots. But let's instead create a bunch of point lights. The fill light is only a function, so if you place ten or 20 point lights to serve as the fill light, that's a good substitution. Of course, indirect illumination does its job pretty well, and the bounced light wraps around the objects. But still, we have to do manual work and ensure that nothing falls to complete darkness. So, the key light peeks through the windows, and everything else is a bunch of point lamps and a few area lights.

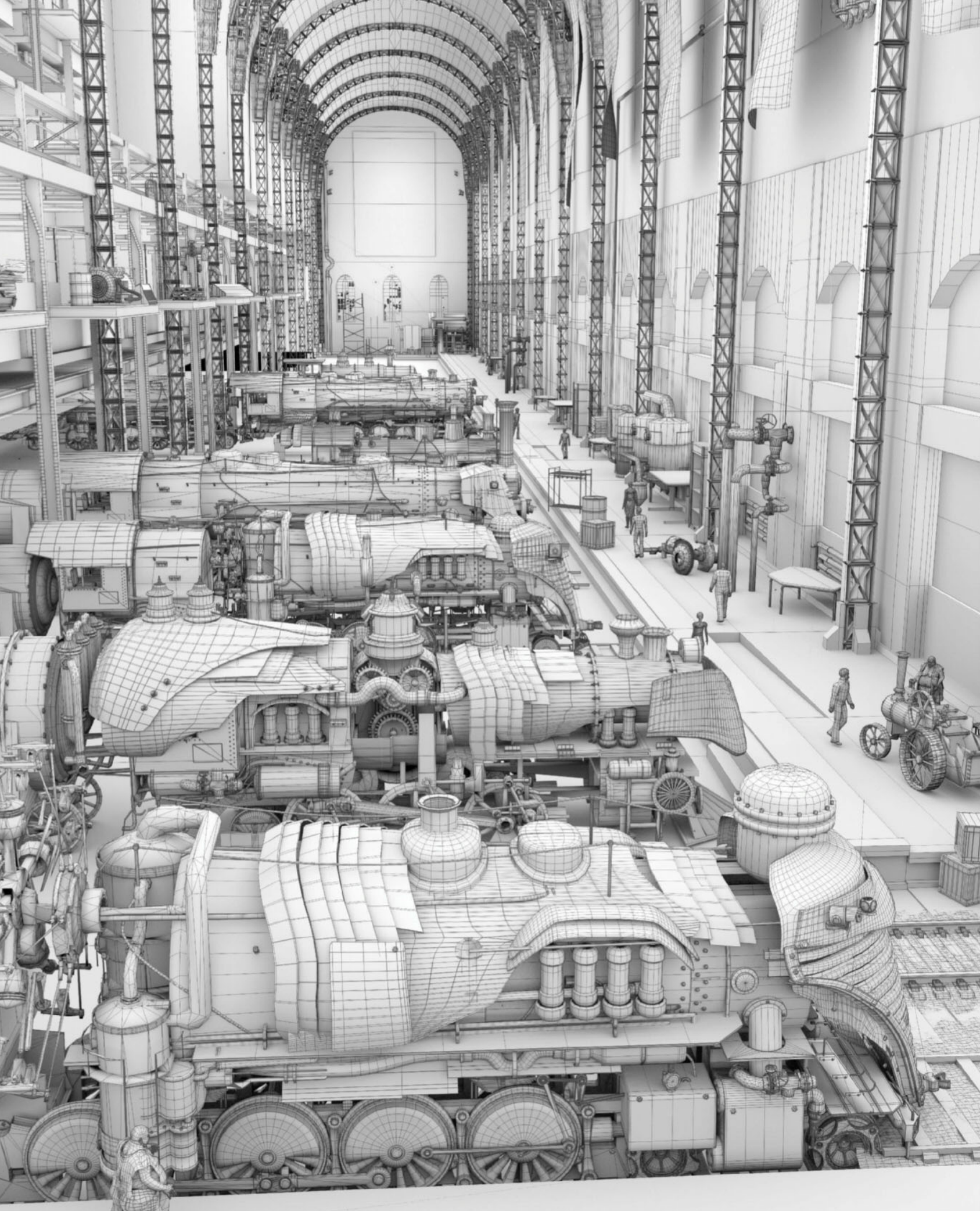
# Showcase

## Gleb Alexandrov

Gleb is a professional artist and creator of educational blog at **CreativeShrimp.com**. He actively participates in the Blender community by sharing tutorials and his experiences of art making. He is a fan of open-source software and community-driven projects. When not rendering weird things, he is writing a book about digital lighting for artists.

***The Ice on Winter Evening*** **Blender, Cycles, Photoshop, (2015)**
Creating a believable ice and light interaction in 3D can be extremely difficult, but also quite rewarding. This image became the basis for the tutorial about creating Ice in Blender, and also the second chapter of Gleb's upcoming ebook about lighting (**www.creativeshrimp.com/create-realistic-ice-lighting-book-02.html**).





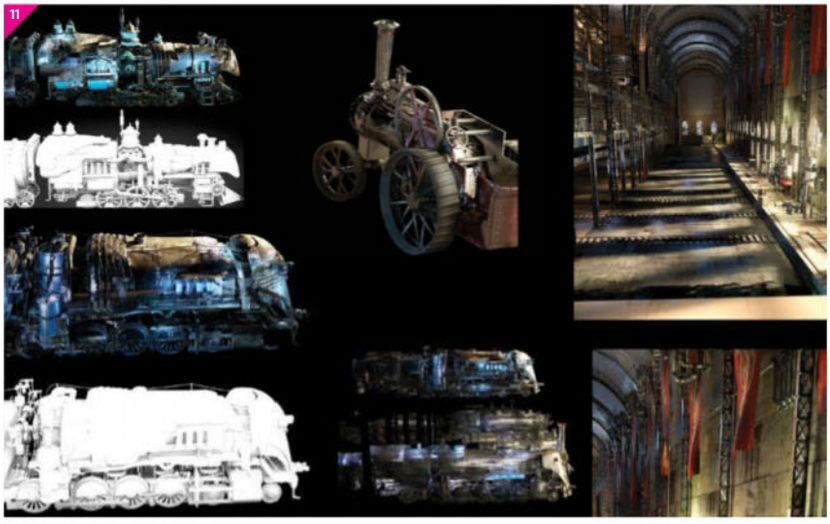
“Make the section of the wall with one window. Duplicate this to form an array. Do what must be done to save time, and copy and paste everything else”

**08 Layered lighting** Now it's time to spice it up and start creating additional layers of illumination, and this is the most exciting part of the workflow! Here we will breathe life into our steampunk world. Awesome! First, add emissive materials where appropriate: for example, the glowing parts of the machines. Don't hesitate to add a few point light sources here and there, even if they won't be physically correct. Just make sure that they are aesthetically correct. For example, place them near the windows to fake light scattering in atmosphere. Illuminate the trains here and there to add visual interest and support the electricity theme. Think of it as a layering process, where every layer of light serves its purpose – to emphasise something, to colourise, and to separate objects from the background. These are okay reasons to tax your computer with additional light sources.

**09 Branched path tracing** In our Blender scene, we already have a pretty sophisticated light setup. The light is pouring through the small windows, and the big part of it gets blocked by the wall geometry. So you can expect lots of noise in Cycles, especially if we want the key light to be soft (size 0.5). To get rid of the noise we can throw in the insane amount of samples in the Path Tracing, or switch to the Branched Path Tracing. The latter solution is usually faster in a final render. What we need to do now is to select the sun lamp and turn up the number of samples. It is really as simple as that. Plus it's advisable to also raise the number of the diffuse bounce samples in the render settings to 2 or 3.

**10 Atmospheric perspective and light rays** The first thing to do in compositing (and this is something that will tremendously affect the whole picture) is to enhance atmospheric perspective. When light rays travel through the thick air of the factory, they make oil and dust particles glow. And the larger the building, the more foggy it will appear from a distance. You can give using the physically correct volumetric lighting as an alternative to postproduction tricks a shot, but we suggest turning on the Mist Pass, set the proper distance of the scene in the Mist Pass settings and then render it out. After that, either mix this pass with the render in Blender Compositor, or do the same trick in the external image editor. Tweak the levels of this pass to control the fog falloff and thickness. Though, you can create a separate scene, enable world volume absorption and assign black diffuse material to every object – that way you'll render only the volume light. Also, one excellent way to make everything better is to fake volumetric lighting using nothing more than a soft white brush in the Add mode and the gradient mask.

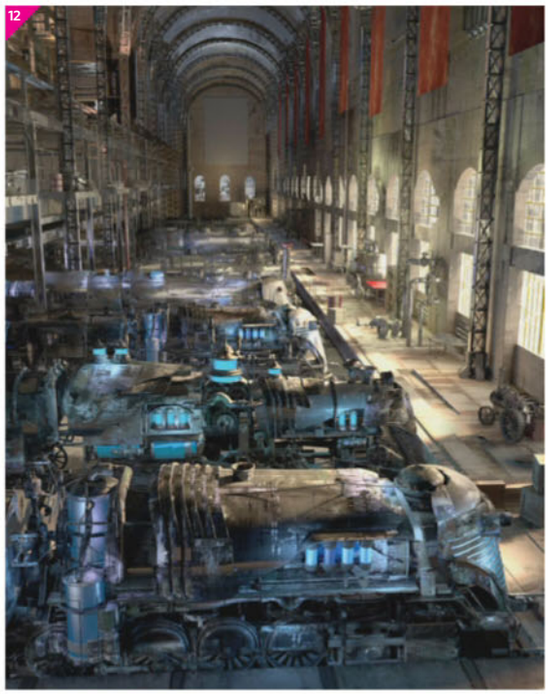
**11 Collect all necessary layers and passes** Congratulations, we have managed to get through the hardest stages of the workflow. You envisioned the steampunk world, modelled the unique layout, and illuminated it Hollywood-style! What now? First, break the scene into layers and render it out. Place the environment (you may think of it as a background plate) on layer one, foreground locomotive on layer two, the second locomotive on layer three, all other locomotives on layer four... you get the idea. We need different layers to be able to tweak objects separately in compose. Activate render passes as needed. For example, you may enable ambient occlusion and Mist Pass for some layers, such as the background.

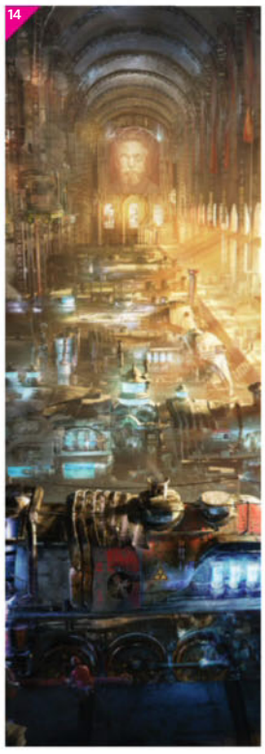


**13 Enhance the picture with matte painting** No turning back now. You can see the imaginary world coming to life, and now it's time to use the Pareto principle to our advantage. This rule states that for many events, 80 per cent of the effects come from 20 per cent of the causes. Thus, if you have already managed to create the bulk of the image then our efforts in Blender are getting less and less efficient. That's why we suggest changing the battlefield and finishing everything in 2D. Set yourself free, start creating the matte painting. Need to add some smoke? Find the free image on Pixabay and insert it into your picture. Maybe you want to push lighting even further? Add a glow, sparks, light streaks – whatever you can imagine. To enhance the scale impression, add some people. We can perceive the scale so much better when we have human figures in the scene.

**14 Final tweaks and colour grading** Do you still remember what the initial image in your mind was, your first vision of a steampunk world? And most importantly, what was the mood? While you are making the final tweaks and colour grading, try to stick to this mood to make a coherent image. Our locomotive depot was hot and sunlit, with occasional cold electric splotches, and we've enhanced this feeling by using complementary colours when we are postprocessing (with emphasis on warm colours). All in all, concentrate your efforts on setting the right mood. Colour grading can make or break the image, so take your time. And share you picture with friends and family members. Do what it takes to get honest feedback.

**12 Make a final composite by using the external image editor** Now when you have all necessary layers ready, paste everything into Gimp or Photoshop and let the fun begin. The process is straightforward. Place the layers in the right order (foreground needs to be placed at the top of the layer stack). If you forget something it's no problem, return to Blender and rerender it. Then place them again. When everything is in place, start tweaking basic stuff, mainly the brightness and the contrast. You can preview your picture in black and white to focus on shapes. Pick a soft white brush with a low opacity and start separating planes and add some air.




## Blender Compositor

We've encouraged you to use Gimp or Photoshop for postprocessing. But what about Blender's built-in Compositor – is it an option? For a basic composite, it's a good alternative to Gimp. But as we want more freedom in adding to our composite, we've used a 2D editor. That's how we deal with the Pareto principle by switching tools – it's easier and faster to fake volumetric lighting in postproduction, than to waste countless hours by simulating it in a physically correct way.



All tutorial files can be downloaded from: **filesilo.co.uk/3dartist**

msi®

MSI recommends Windows.

# BUILDING IDEAS

## WS60 2OJ

start from £ 1,999

# ULTRA THIN WORKSTATION

Windows 8.1 | Quadro GPU | Thunderbolt2 | 4K IPS display | SuperRAID
Matrix Display | Cooler Boost2 | Shortcut Manager

WORKSTATION

intel inside™ CORE™ i7

Intel® Core™ i7 Proccessor
Explore new ways to learn and stay connected with Intel Inside®

Intel, the Intel Logo, Intel Inside, Intel Core, and Core Inside are trademarks of Intel Corporation in the U.S. and/or other countries.

## Our experts

**Maya**
**Amaru Zeas**
**www.amaruzeas3d.com**

Originally from Cuenca, Ecuador, Amaru is a passionate 3D Artist based in Seattle

**Cinema 4D, Photoshop**
**Gustavo Åhlén**
**www.gustavoahlen.com**

Gustavo Åhlén is the founder of Svelthe. He is also a 3D/VFX designer for films, games and advertising

**Maya**
**Jesper Børlum**
**elementacular.alexandra.dk**

As senior computer graphics engineer at the Alexandra Institute, Jesper focuses on innovation

MAYA

# Disintegrate a model with nCloth and nDynamics

There are so many ways we can make our renders more interesting and creative. You would be surprised how quick and easy it is to create amazing effects using Maya's nCloth and nDynamic Force Fields such as Newton or Volume Axis. nCloth is a dynamic cloth solution that uses particles to simulate dynamic polygon surfaces. You will find nCloth useful for simulating fabric clothing, shattering surfaces and deformable objects. Now, to make the particles move we will need to add a force and Maya has a powerful nDynamic system for this purpose. You can use nDynamic Force Fields and Point Force Fields to generate fields to push or pull Nucleus objects. There are several Force Fields that we can use like Drag, Newton, Vortex, Volume Axis and more. In this tutorial we will be using Volume Axis just because it works perfectly with the effect that we want to create. Volume Axis has incredible attributes that we can play with.

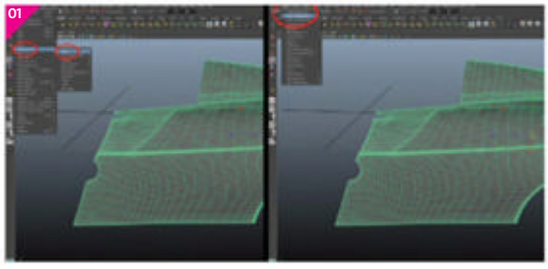
This tutorial will work using any polygonal object and the poly count doesn't matter, however keep in mind that using high-polygon models will increase the time taken for you to complete the tutorial. There are also several ways to create the same effect and you can find them online if you wish.

There will be six steps that will help us in this tutorial. We will start by setting the scene and then we will go over nCloth. After having a better understanding of how nCloth works, we will go over nDynamics and Field Forces. Finally we will set the scene to create the final simulation.

**01 Set up the scene** In Maya create a new scene, File>New Scene, just to make sure that we start with a clean setup. Open or import a polygonal object that you want to work with. It doesn't matter how complex the object is or its topology. We will be working with a piece of a car that we have modelled for this tutorial. Select the object, freeze transformations and delete history by going to Edit >Delete by type>History and to Modify>Freeze Transformations.

**02 Detach polygon's faces** Now separate the faces of your object so that we can make them move individually. We will use Detach Component (located in the Polygons menu under Edit Mesh). Select your object (note that any users with Maya 2014 or older versions might need to go to Vertex mode before using Detach). Now go to Edit Mesh>Detach and click. You will see that the object's vertex is highlighted. Also on your object you can go to face mode, select a face and it should now move individually from your object.

**03 Make the object nCloth** It's time to covert the object into an nCloth and change the Menu set to nDynamics. Select your object then go to nMesh>Create nCloth. This will create an nClothShape and a Nucleus. You can




YOUR FREE DOWNLOADS
from **filesilo.co.uk/3dartist**
• Tutorial screenshots

see the new attributes under Attribute Editor by selecting the object. The nClothShape and the Nucleus have different attributes and we will be using them back and forth until we get the desired effect on the nMesh.

## 04 nClothShape and Nucleus attributes

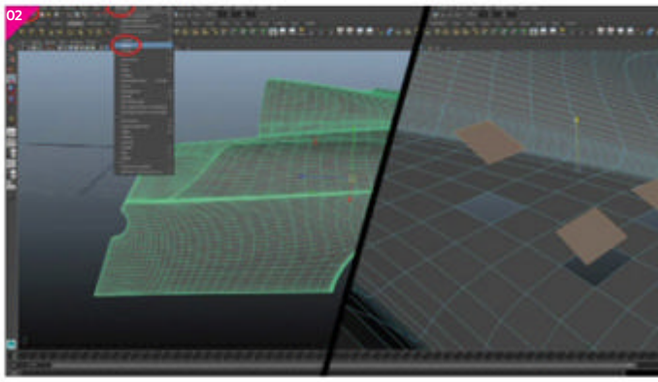
Open the Attribute Editor by selecting the object. We are going to set up three main attributes on the nClothShape and Nucleus so that the simulation will be faster and more efficient. First, click on the nClothShape tab then open the Collisions attribute. We want to uncheck the Collide and Self Collide option box. If you want you can leave Collision on but the simulation will be very expensive. Lastly, go to the Nucleus tab and under the 'Gravity and Wind' attribute set Gravity to 0 since we want only the Field Force to have any effect on the object.

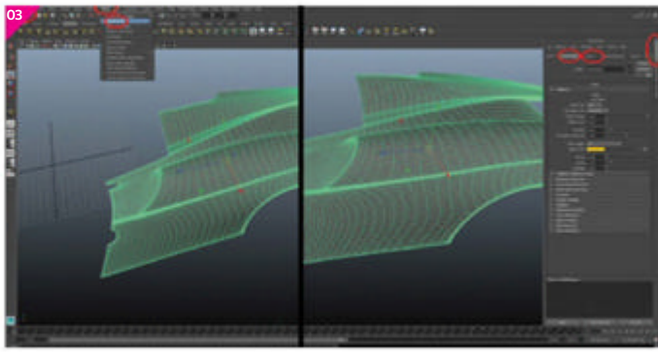
## 05 Add Force Field with nDynamics

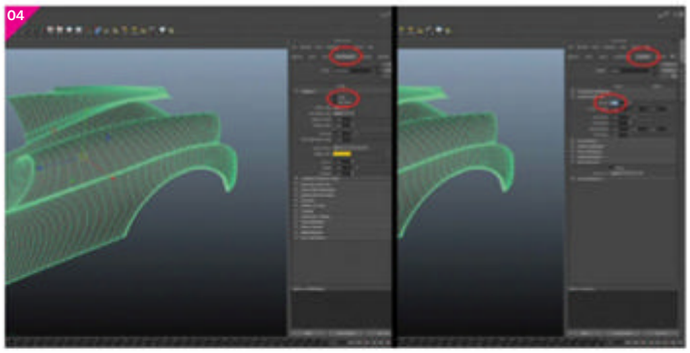
We will be using Volume Axis Field so select the object and go to Fields>Volume Axis. We might be changing quite a few attributes and we will do this by selecting the field that you just created, going over to the Volume Control Attributes and changing the Volume Shape to Sphere. Under Volume Axis Field Attributes set Magnitude to 1 and Attenuation to 0.1 (this will be for falloff). Directional Speed should be set to 10 and Direction on y to 20 with z at -30. Under Volume Speed Attributes set Along Axis to 5. Let's play with the Turbulence by setting it to 3, Turbulence Speed to 1, and Turbulence Freq x y and z set to 4.

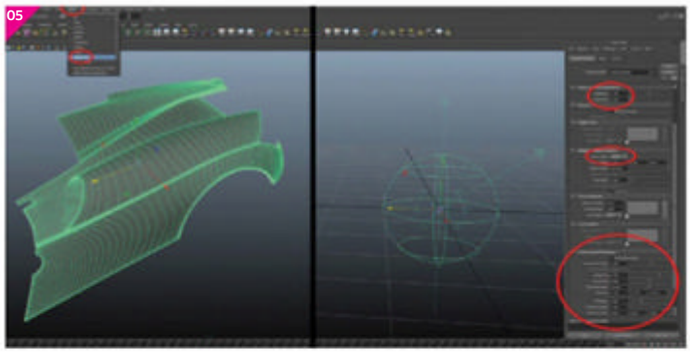
## 06 Get a simulation

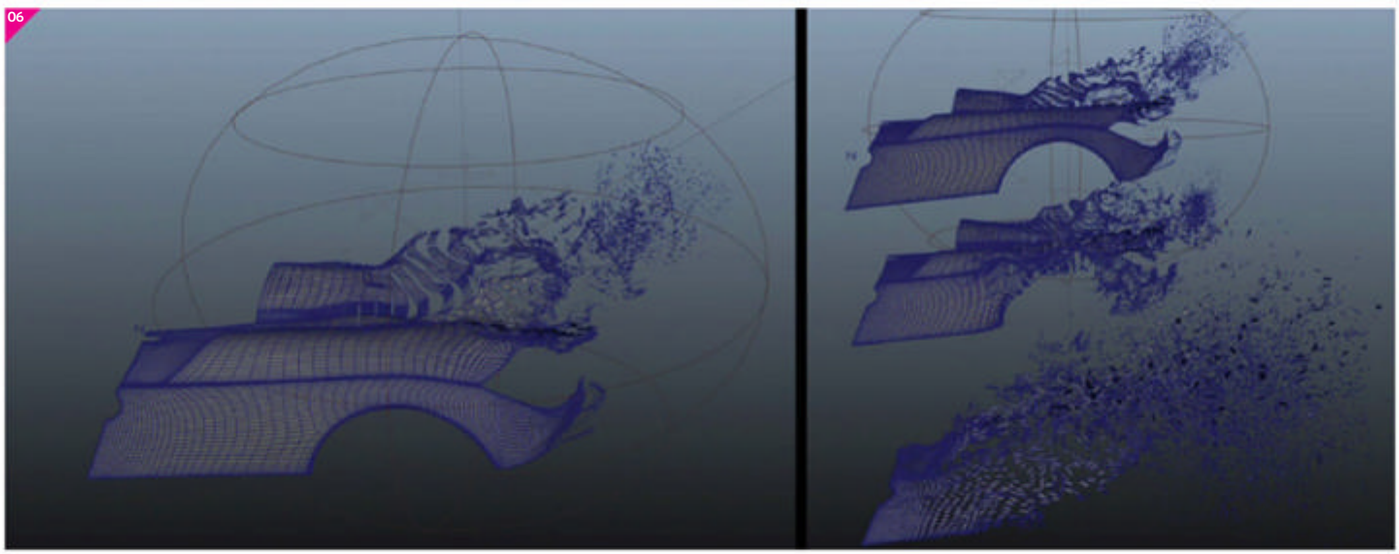
You can see that the field has two arrows pointing at different directions and the particles will move to those directions. Hit play and you will see the simulation. Finally we can place the field at the back of the object. Create an animated key on frame one then go to frame 100, move the field and create another key so that the field has an animated motion. You can pause the animation and make a copy of the object to have them as a reference. Remember that our settings works well on this project but you can of course change them accordingly for your own project to achieve different results.



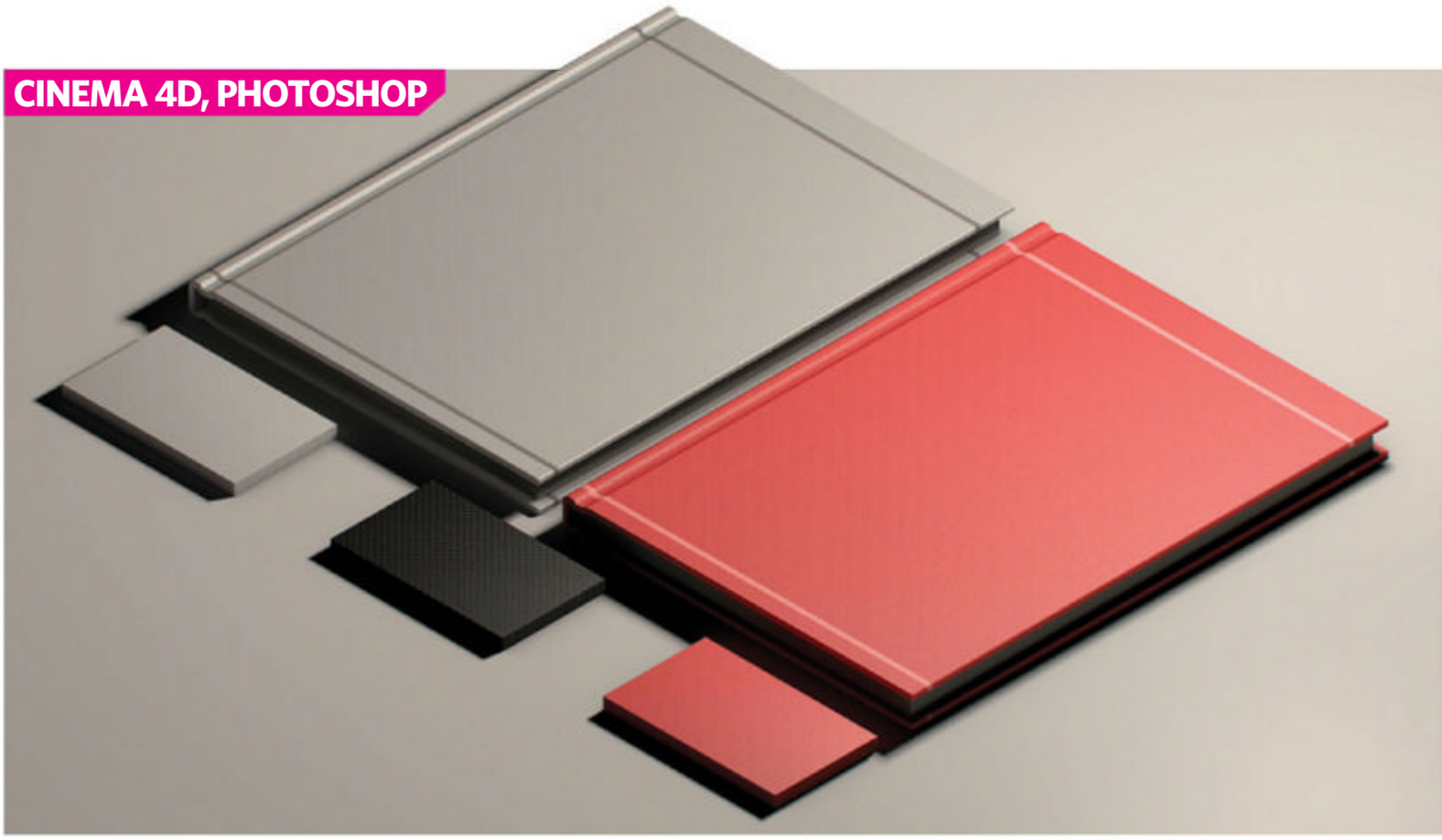



CINEMA 4D, PHOTOSHOP



# Re-create paper textures in 3D

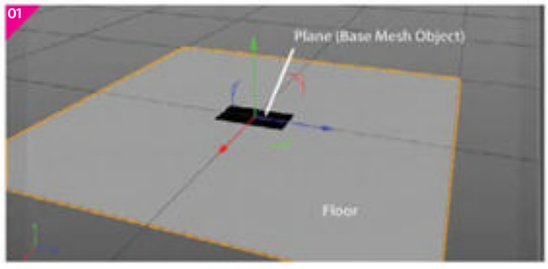
This tutorial is mainly focused on those who want to create a mockup of a professional portfolio and imitate the paper texture. For this we need to learn how to re-create it using Cinema 4D.

How many times have you seen those great, professional mockups of books, business cards and logotypes but you didn't know how they were made? Indeed, some of these are just photographs taken in a studio, but using different techniques of 3D we can re-create anything from the real world. Something to keep in mind is the resolution of the textures used for this tutorial because this will enable us to get a true copy of the real thing.

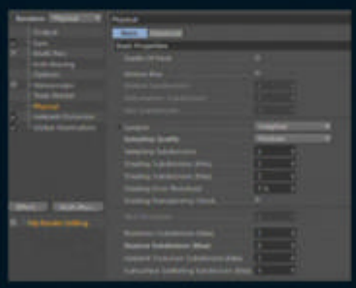
Firstly we must pay attention to the light settings and the type of lights used in our scene which will enable us to get a better quality in the final work. We must keep in mind the channels of Bump and Displacement because they let us increase the level of details of the paper surface. In those channels using different noise shaders we can achieve any kind of texture that we want, or if we like other texture patterns we would have to save our selected texture and then import into the slot of Texture. With the colour of the paper we would have to change the parameters of the Diffusion channel and for reaching a better realism we would have to activate the Specular channel. The Specular channel is essential to reflect the light in some or all areas of the paper to achieve a glossy or matte paper. In the Specular channel, we recommend using an Alpha texture (black and white) so that the reflections are set on certain areas of the paper. This process is perfect for creating random glossy areas.

In our case, to get a preview of the final render we used the option of 'Render region'. This option is perfect for saving a lot of time and it helps us to render small areas getting a preview of the final work. Don't forget to activate Anti-Aliasing in the render settings. To get a fast preview use Anti-Aliasing: Geometry. For this piece of work we used a Standard Render, but you can also use a Physical Render if you want to test other great methods of rendering, but this one will take more time. Okay, let's get started...

**01 Make the base mesh and background** We need to create a base mesh to be applied to the paper texture. We can model a book, notebook or just a simple piece of paper. In the first instance, and for testing the paper texture, we used a simple plane. Click on the Cube object, and use these size parameters for this object: 200cm for x, 1cm for y and 200cm for z. This object should be located in the middle of the scene. Now add a Floor object and this one will be the colour of the background where the objects in our scene are supported.

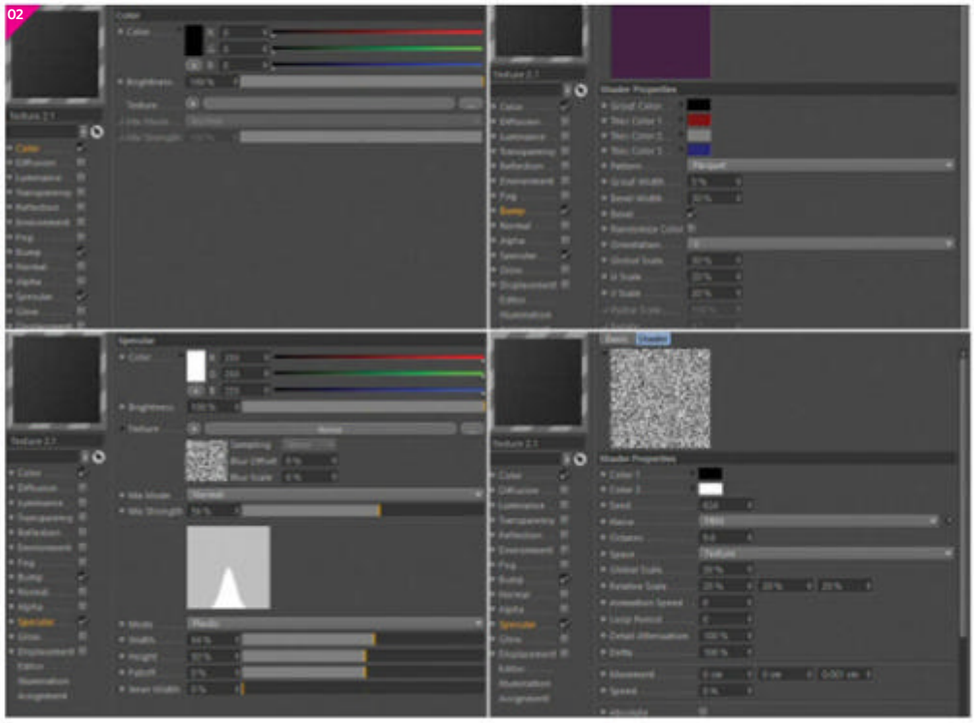



**YOUR FREE DOWNLOADS**
from **filesilo.co.uk/3dartist**
- Scene file
- Tutorial screenshots
- Tutorial video



## Physical Sky

If you want to test other studio parameters, then use Renderer>Physical and add a Physical Sky. Then create a texture activating the channel Luminance and in the Texture slot>SSS. This will increase realism in our scene. This material (Texture 2) is available on the C4D file, so that you can see the parameters as the other channels activated. Also in the attached file you will see a Physical Sky and an Area Light object. These are two options of studio lighting and when you activate one, you need to deactivate the other.



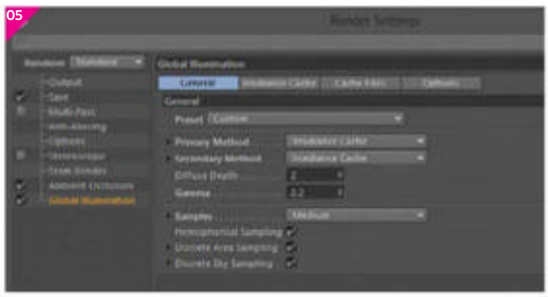

**02 Create the paper texture** Go to the palette of materials and create a new material. In the first texture, use a black paper with an embossed texture. Now we need to activate the Color, Bump and Specular channels. In the Color channel, use a black color (RGB=000), in the Bump channel use 15 per cent on Strength and in the Texture slot use Tiles. Click on Tiles, selecting a pattern as Parquet with a Global Scale of 50 per cent and UV Scale of 20 per cent. You could play with these parameters according to your personal tastes. Now we need to activate the Specular channel using FBM for the Noise in Texture.

**03 Add lights to the scene** The current step is fundamental to get a realistic render. If you don't configure this step as we teach, surely your render will not look realistic enough. Then, add just one Area Light object and activate area shadow with Minimum Samples at 64 per cent and accuracy at 100 per cent with an area shape as Hemisphere. Now add an object as Array and drag and drop the object into the light object previously created into the Array object to duplicate the area light using 'copies=1'. Meanwhile increase the radius to 840cm to get separate lights from the main area which is where we will situate the scene objects.

**04 Ambient occlusion** Activating AO is preferred because it achieves a more realistic render. This technique is used to calculate how exposed each point of the scene is to the ambient lighting. Ray tracing calculations simulate soft global illumination shadows. To activate this option, go to Render Settings and in a menu called Effects, you need to select the option of Ambient Occlusion. You can change the minimum samples from ten to 32 or even more if you would like and change accuracy to 75 per cent.

**05 Use Global Illumination** We are using Cinema 4D R15 for this piece of work. This version of Cinema 4D has rebuilt the GI interface and the algorithms used in the previous versions, and its version is faster and more stable than the old ones. GI is a great way to increase the realism in your renders because this method takes into account a direct illumination and adds a secondary illumination as it bounces, which enable us to get more realism in the scene. You could change the current parameters using high levels in samples if you want to.

**06 Final adjustments** Now we need to adjust the last parameters. We used the Anti-Aliasing option of Best with a filter of Sinc. You could use other filter types to see what is more according your tastes but in our case, we preferred the option of Sinc. In Output we used a resolution of 1920x1200 with 300dpi. In postproduction, once you've rendered the scene you can edit the final work in Photoshop adding Chromatic Aberration to increase the realism and adjust some parameters in the contrast, curves and levels, for example. Try to test different parameters in GI to improve them all.



MAYA

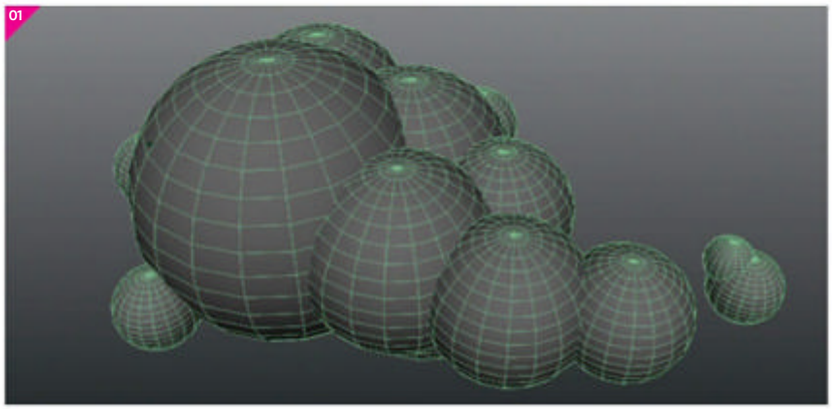
# Generate a thundercloud using Elementacular

Creating and lighting volumetric clouds can be a cumbersome process. Traditional methods involve fluid simulation, which when performed at high-resolution is a very CPU-intensive process. Furthermore, it is nearly impossible to alter the resulting clouds after simulation, as you would have to start over again with new parameters. Real clouds consist of water vapour and when these are subjected to sunlight they become a highly scattering material. To render clouds realistically you will need to employ a technique known as multiscattering, which will then increase the rendering time significantly.

The Elementacular plugin for Maya introduces a new workflow, which tackles the issues outlined. Unlike traditional methods, which mainly use the CPU for calculations, Elementacular uses a GPU-based engine for all calculations. Modern GPUs (or commonly known as the processor on your graphics card) are extremely powerful when it comes to processing large amounts of data – a feat which maps well to creating volumetric multiscattering clouds. Elementacular focuses on enabling the artists to work with final-frame quality clouds directly in the viewport of Maya while still maintaining the flexibility to resculpt the form, adjust parameters or move lights around the scene. The most important feature for a digital content creation tool is for the artist to have direct control of the results, and to maintain the ability to iterate and refine throughout the creation process. Traditional fluid simulation-based methods require the artist to run several simulations while tweaking many interconnected input parameters in-between each simulation to achieve the desired appearance.

Alternatively, you may seed particles inside a base geometry that represents the wanted look. Elementacular at its core is a powerful GPU voxeliser that is able to turn polygonal geometry into signed distance fields in real-time. Creating a cloud in Elementacular is as simple as applying a shader to a geometry object. A key feature of this geometry-based approach is that the underlying geometry is editable throughout the process and the resulting cloud will continue to represent the shape of the geometry – so no more waiting around for simulations, relighting or rendering. We render the clouds using a state-of-the-art real-time GPU-based multiscattering approximation tuned for this specific purpose. This enables the artist to instantly preview any changes to scene lighting. The following tutorial will show you how to create the animated indoor thundercloud as seen in the video on FileSilo. We will guide you through all the steps involved, creating the base geometry, creating the cloud and animating the scene lighting that is used to simulate the lightning inside of the cloud.

**YOUR FREE DOWNLOADS**
from **filesilo.co.uk/3dartist**
- Scene file
- Tutorial screenshots
- Tutorial video




## 32-bit HDR rendering

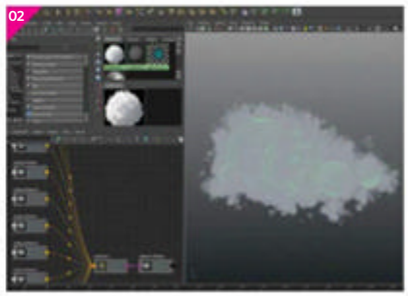
Elementacular supports a full 32-bit linear workflow. Images of clouds have areas which contain very high intensity areas (areas directly lit by the sun), and many very dimly lit detailed areas. The shader tonemaps the result in the viewport to enable the artists to adjust the final look of the cloud – Maya only recently added support for 32-bit render targets in the viewport (Maya 2015 Extension 1). It is possible to create images with the shader tonemapper enabled, but compositing these images will be harder as the Alpha mask is no longer linear and will result in problems in the transparent areas.

**01 Create the base geometry** When creating an Elementacular cloud, the first thing we need to do is to create the base geometry that defines the course of the cloud shape. Here we have added a couple of spheres that have been combined into a single geometry. Do not worry about getting the shape just right before proceeding to the next step – you will be able to change the shape no matter how far into the tutorial you get. Elementacular supports any shape of polygonal geometry, so feel free to use any model.

**02 Turn geometry into cloud** Converting the base geometry into a volumetric cloud is as easy as applying the Elementacular cloud shader. Open the Hypershade window and create a new instance of the shader. Select the base geometry and apply the created instance. The default cloud will look kind of bland as it is constructed using the default parameters and the scene is not lit yet. It is very important that Maya uses the Viewport 2.0 (default in Maya 2015) and has 'Smooth shade all' and Textured enabled, as the cloud will not show up otherwise. Try to move the camera around or through the cloud.

**03 Set up the scene** We have created a basic textured plane with the proposed background as a frame of reference. The camera is set up as a basic Camera, Aim and Up, which is used to place the cloud in the scene. To be able to further tweak the look of the cloud you will need to add some scene lighting. Here we've selected a basic coloured point light placed to the left to mimic the scene light. Elementacular requires the light sources to be quite powerful so go ahead and set the intensity of values to around 100-300.

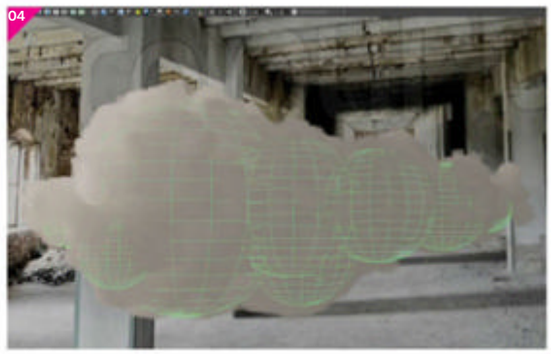
**04 Tweak the cloud** We have switched to the default persp camera to get a better view of the cloud before starting to tweak the noise parameters. The Elementacular shader exposes many parameters through the attribute editor. Each

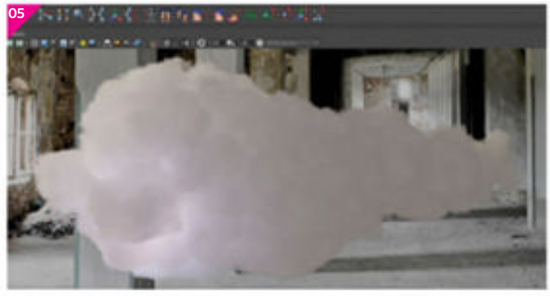


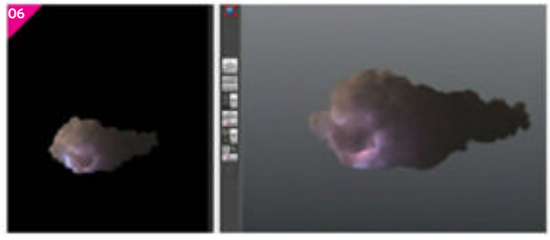

parameter changes a certain aspect of the look of the cloud and is grouped accordingly. The shader uses two layers of noise to define the final cloud look – one large scale (noise) and one microscale (wispy). Creating great-looking clouds is highly dependent on getting the noise correct. The parameters instantly change the cloud so play around with the values.

**05 Animate the lightning** Place two very bright point light sources inside of the cloud. Inspired by some reference video material, we have made one bright orange and one bright blue. The light sources have been made very bright (intensity values around 500-5,000) because the cloud is as dense as it is. The density must be set very high (density scale around 13) to achieve the large thundercloud look. Then animate the light intensity to create the illusion of lightning inside the cloud. Translate the light sources after each flicker to avoid having too many active light sources in the scene, as this will reduce the real-time performance dramatically.

**06 Render the sequence** Open the Render View and render the frames through the Aim camera. The rendered cloud shown in this step looks quite different, as the observant reader will already have noticed. This is because we have turned off the built-in tonemapping that helps artists tweak the look of the cloud directly in the viewport. The created image sequence is now ready to import into your favourite postprocessing tool. We chose to use Adobe After Effects when creating the video available on FileSilo.



# Technique focus

**Incredible 3D artists take us behind their artwork**

**HAIR CREATION** I like the minority culture in China and in Tibet. I saw a very beautiful oil painting of Tibet and thought it was great, so I decided to create my own interpretation of it. This is a big scene. I spent a total of four and a half months completing the piece. A challenge was the hair, for which I used nHair in Maya and FiberMesh in ZBrush.

**Ding Zheng Wei**
**blog.sina.com.cn/xiaoddzw**

Zheng Wei worked as an artist for XPEC Entertainment on games like *The Last Of Us*

**Software** Maya, ZBrush,V-Ray, Marvelous Designer, Mudbox, Photoshop

**Pilgrimage,** 2015

# 3DArtist SPECIAL SUBSCRIPTION OFFER

# SUBSCRIBE AND SAVE 40%

HOUDINI 14
Our definitive review of SideFX Software's exciting new offering
8GB OF FREE ASSETS EQUIVALENT TO 12 DISCS
78
www.3DArtistonline.com
3DArtist
Practical inspiration for the 3D community
DRIVING THE 64-BIT REVOLUTION
ZBRUSH 4R7
New features revealed | Beta testers interviewed | CG professional review
BLENDER HARD SURFACE MODELS
Gleb Alexandrov brings you 17 steps for creating awesome environments
OUR EXCLUSIVE VERDICT PAGE 78
BRIDGE
MAYA STUNNING PORTRAITS
Ian Spriggs delivers an exclusive masterclass
PLUS
• Chappie VFX
• Build a ZBrush robot
• Thunderclouds in Maya
• Photorealism in Cinema 4D
12 DISCS' WORTH OF CONTENT
3+ HOURS OF ZBRUSH VIDEOS
HITFILM 3 PRO DEMO VERSION
MODELS WORTH OVER $200
ISSUE 78
£6.00

**PAY ONLY £10.80 EVERY 3 ISSUES**

INCREDIBLE STEP-BY-STEP TUTORIALS

EXCITING, INDUSTRY-LED FEATURES

ORDER HOTLINE
**0844 249 0472**

ONLINE AT
**www.imaginesubs.co.uk/3da**

# EVERY ISSUE PACKED WITH...

- **Exclusively commissioned art**
- Behind-the-scenes guides to images and fantastic artwork
- **Digital downloads of amazing assets**
- Interviews with inspirational artists
- **Tips for studying 3D or getting work in the industry**
- The chance to see your art in the mag!

# WHY YOU SHOULD SUBSCRIBE...

- **Save 40%** off the cover price – **just £10.80 every 3 issues** on Direct Debit
- **FREE delivery** direct to your door
- **Never miss an issue**

# ORDER BY

31 MARCH 2015

Use code **PQ15** for this offer

## BY POST

Send your completed form to:
3D Artist Subscriptions, 800 Guillat Avenue,
Kent Science Park, Sittingbourne, Kent ME9 8GU

## YOUR DETAILS

Title_____ First name_____

Surname_____

Address_____

_____

_____

Postcode_____ Country_____

Telephone number_____

Mobile number_____

Email address_____

## DIRECT DEBIT PAYMENT

☐ **UK Direct Debit Payment**

**I will pay just £10.80 every 3 issues - save 40%**

**Instruction to your Bank or Building Society to pay by Direct Debit**

DIRECT Debit

Please fill in the form and send it to: Imagine Publishing Limited, 800 Guillat Avenue, Kent Science Park, Sittingbourne, Kent, ME9 8GU

Name and full postal address of your Bank or Building Society

To: The Manager — Bank/Building Society

Address

Postcode

Name(s) of account holder(s)

Branch sort code

Bank/Building Society account number

Originator's Identification Number: 5 0 1 8 8 4

Reference Number

Instructions to your Bank or Building Society
Please pay Imagine Publishing Limited Direct Debits from the account detailed in this instruction subject to the safeguards assured by the Direct Debit guarantee. I understand that this instruction may remain with Imagine Publishing Limited and, if so, details will be passed on electronically to my Bank/Building Society

Signature(s)

Date

Banks and Building Societies may not accept Direct Debit instructions for some types of account

A6 instruction form

## PAYMENT DETAILS

**YOUR EXCLUSIVE READER PRICE, 1 YEAR (13 ISSUES)**

☐ **UK £62.40 (Save 20%)** ☐ **Europe – £70.00**

☐ **World – £80.00** ☐ **USA – £80.00**

**Cheque**

☐ I enclose a cheque for £_____

(made payable to Imagine Publishing Ltd)

**Credit/Debit Card**

☐ Visa ☐ Mastercard ☐ Amex ☐ Maestro

Card number

Expiry date

Issue number ☐☐ (if Maestro)

Signed _____

Date _____

Please tick if you do not wish to receive any promotional material from Imagine Publishing Ltd by post ☐ by telephone ☐ via email ☐

Please tick if you do not wish to receive any promotional material from other companies by post ☐ by telephone ☐ Please tick if you DO wish to receive such information via email ☐

**TERMS & CONDITIONS**

This offer entitles new UK direct debit subscribers to pay only £10.80 every 3 issues. New subscriptions will start from the next available issue. Offer code PQ15 must be quoted to receive this special subscription price. Details of the Direct Debit guarantee are available on request. This offer expires 31 March 2015 . Imagine Publishing reserves the right to limit this type of offer to one per household. Subscribers can cancel this subscription at any time.

# Lenovo ThinkStation P500

## A mid-range rendering workstation with a quad-core Xeon chip and Nvidia Quadro K4200

When asked for advice about buying a workstation, our usual answer is to go for an all-rounder that offers plenty of CPU and graphics power, memory and storage, and will be a great configuration whatever software you prefer to use.

There are a few exceptions though. For example 3ds Max relies heavily on CPU performance, so if you work exclusively with it, opting for more CPU cores will make a considerable difference. Maya favours AMD graphics cards so you may get better performance from a FirePro than a Quadro, but that's if Maya is your main 3D application.

For people who work with a variety of software, it makes better sense to opt for a workstation that is flexible and tailored for any situation. That description is a perfect fit for Lenovo's P500, a mid-range system with a good specification across the board, but thankfully, without any single ultra high-priced component that sends its total retail cost soaring.

Decked out in the now-familiar ThinkStation red and black styling, the front of the slim case has a mesh with a section Lenovo calls the FLEX Tray, which juts out by a few centimetres and houses the optical drive, front USB 3.0 ports and a card reader. It's not a bad look at all for a corporate machine.

But unlike many corporate machines, Lenovo makes it easy to reach inside and mess with the internals. There's a clean, modular internal design, intended for tool-free modding, so adding extra storage or swapping out the memory is simple.

The P500 configuration was sent to us with a 3.7GHz quad-core Intel Xeon E5-1630 v3 processor, part of the Haswell-E CPU family that is currently proving so popular among vendors. There's also a very nice 2133MHz 32GB of DDR4 memory and an Nvidia Quadro K4200 graphics card. It isn't outrageously high-end, but this configuration is a clear step above entry-level and unlikely to cause problems unless you're working on the most complex of 3D scenes.

Of particular interest is the Quadro K4200, as it's the more powerful of Nvidia's mid-range cards, with 4GB of GDDR5 memory and 1344 CUDA cores. It's a big jump up from the K2200, which offers less than half the number of cores and memory bandwidth.

The Xeon E5-1630 v3 CPU is a solid choice. It runs at a slightly lower clock frequency than Intel's 4GHz Core i7-4790k processor and hence it doesn't quite beat the i7 in benchmark tests, but it's still good enough.

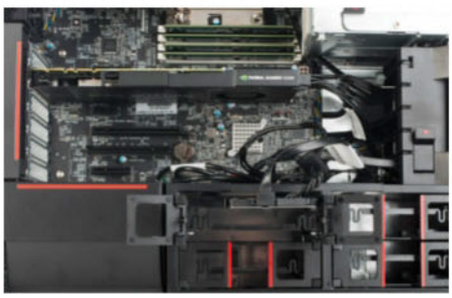
In CINEBENCH it achieved a score of 747, which is about 40 points lower than a Core i7 – a barely noticeable difference. Render times in 3ds Max were as expected from a quad-core chip: four minutes to complete the Underwater test, and 15 minutes and 30 seconds at 1080p resolution. This is slightly faster than last year's mid-range workstations and is boosted by the extra bandwidth of DDR4 memory.

We got some excellent results from SPECviewperf and ArionBench too. The K4200 completed the ArionBench CUDA render with a score of 935, almost double that of the K2200. SPECviewperf relies on both the CPU and GPU though. The K4200's score was double that of the K2200 in the catia-04 section of the test, but in other sections of the SPECviewperf suite, the gap between the two cards was less pronounced.

Upgrade options include up to ten SSDs and six hard disks if you wish to expand the storage when purchasing, as well as an optional Thunderbolt 2 expansion and Xeon E5-2600 series CPUs with extra cores. The real upgrades come in Lenovo's other ThinkStations though, such as the P700 which offers dual CPUs, or the P900 which supports extremely high-end configurations that can cost as much as a deposit on a house (three Quadro K6000 graphics cards, anyone?)

Those systems are like the supercars of the 3D industry, both unbelievably powerful and expensive. It's the mid-range where the bulk of the market lies though, and being a great all-round rendering system is what makes the P500 such a good fit.

**Orestis Bastounis**



**ABOVE** The side of the Lenovo P500 pops off by flicking open a small latch, enabling easy access

**ABOVE** The P500 has a Quadro K4200, which won't break the bank but is certainly an upgrade on its predecessor

> The E5-1630 v3 CPU is slightly faster than last year's mid-range workstations

**ABOVE** Tool-free installation makes adding storage or changing motherboards easy

## Essential info

| | |
|---|---|
| Price | £1977.35 ex VAT, £2372.82 inc VAT |
| Website | www.thinkworkstations.com |
| CPU | Intel Xeon E5-1630 v3 |
| Chipset | Intel C612 |
| GPU | Nvidia Quadro K4200 |
| Memory | 32GB 2133MHz ECC DDR4 |
| OS | Windows 7 |
| Storage | 256GB SSD |

## Summary

- Features
- Performance
- Design
- Value for money

## Verdict

The P500 is a top-quality mid-range workstation that really shows Lenovo's strong commitment to working with 3D professionals

**LEFT** The FLEX bay is a neat idea that makes upgrading even easier

# AMD FirePro W7100

## A significant performance gain for AMD Sapphire's middle-of-the-road graphics card

The FirePro W7100 straddles the boundary between ultrapowerful graphics cards, which represents the best possible rendering performance you can get from a workstation and hardware that's affordable to the majority of users.

So while it's not the fastest graphics hardware that money can buy, the W7100 still packs some tremendous rendering muscle. Its carefully slimmed down specification means it's suitable for most budgets, but without the four-figure premium you find attached to cards like the Quadro K6000 or FirePro W9100.

The W7100 is a single-slot PCIe graphics card, with a six-pin power connector. As before, it's manufactured, but not branded, by AMD's long-term partner Sapphire.

As part of the refresh of its line-up, AMD has made two notable improvements to what the Tonga chipset of the W7100 offers over the older Pitcairn XT technology in the W7000. The graphics memory has been doubled, from 4GB to 8GB GDDR5, a welcome move that will no doubt be put to good use with demand for higher resolution scenes and extra model complexity.

And the overall performance is roughly a third higher, offering 3.3TFLOPS of single-precision number-crunching power, up from 2.4TFLOPS. AMD has achieved this with an increase to the number of unified shaders – now totalling 1792 – and texture units up to 112, but a slim reduction in overall clock speed to 920MHz helps the card remain within the 150W power consumption limit.

Headline new features include DirectGMA memory, which alleviates pressure on the system resources by reducing CPU utilisation and the amount of PCIe transfers, along with GeometryBoost, which doubles the number of geometry operations per cycle to four.

Hardware API support has been substantially improved too. Along with OpenGL 4.4 and DirectX 11.2, OpenCL 2.0 has native support, a welcome update due to the ubiquity of this extension. Such a wide range of 3D software now supports GPU computation and it is now a major consideration when purchasing any graphics hardware, alongside traditional polygon-pushing performance.

The number of outputs has been added to also, with the maximum resolution offered and refresh rates supported. AMD Eyefinity cards, including the W7100, support up to six displays and it makes truly humongous desktop areas a realistic prospect when combined with a suitably sturdy monitor arm. But if you're looking at multiple 4K screens, such a massive number of pixels is limiting for all current graphics cards, including the W7100.

It supports four 4K outputs at 30Hz via DisplayPort 1.2a, or alternatively three at 60Hz, with the higher refresh rate necessary for usably smooth mouse movement.

We used the W7100 in a workstation powered by a 4GHz Intel Core i7-4790K processor, with Cinebench 15 and SPECviewperf for graphics tests and LuxMark for OpenCL testing. With a wide range of results from other cards used in similarly specified workstations, it's clear to see where the W7100 fits in.

A Cinebench OpenGL score of 144FPS is about 20 per cent behind the W9100, which scored 167. In SPECviewperf, the difference is wider, with the W7100 achieving 56.5 in catia-04, versus 77.7 from the W9100, and a Maya score of 59.5 compared with 73.75.

LuxMark's two-million triangle Room benchmark yielded an OpenCL score of 819, while the W9100 recorded 1390, and the W8100 sits neatly between the two at 1170 points.

The FirePro W7100 costs about a third of the asking price of a W9100, while delivering roughly two-thirds the performance.

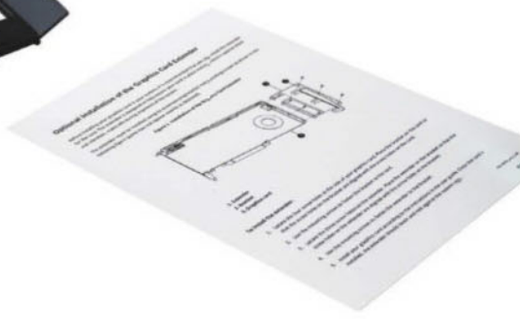
It's the relative affordability without the sacrifice of its power that will make the W7100 a go-to choice for AMD-based rendering workstations.

**Orestis Bastounis**

**BELOW** The W7100 is a single-slot card with relatively modest power requirements

**ABOVE** AMD 's FirePro graphics cards are great for acceleration of OpenCL software

> Headline new features include DirectGMA memory and GeometryBoost



**LEFT** Six-screen monitor setups are possible, but only three 4K screens can operate at 60Hz

**ABOVE** The W7100 has been manufactured by long-term partner Sapphire

## Essential info

| | |
|---|---|
| Price | £610 / $800 USD |
| Website | www.amd.com/en-us/products/graphics/workstation/firepro-3d/7100 |
| Core clock | 920MHz |
| Shaders | 1792 |
| Memory | 8GB |
| Memory clock | 1400MHz |
| Memory bandwidth | 160GB/sec |

## Summary

| | |
|---|---|
| ★★★★☆ | **Features** |
| ★★★★☆ | **Performance** |
| ★★★½☆ | **Design** |
| ★★★★☆ | **Value for money** |

## Verdict ★★★★☆

The W7100 is one of AMD's strongest Tonga-based FirePro cards, offering great performance while remaining affordable

# ZBrush 4R7

## The new version of ZBrush is a milestone as 64-bit support and essential tools make their debut with 4R7

The long-awaited ZBrush 4R7 is here. Pixologic once again has surprised us with a whole batch of new tools including a KeyShot Bridge, KeyShot for ZBrush, ZModeler, ArrayMesh and NanoMesh. It is also the first ZBrush version to have 64-bit support.

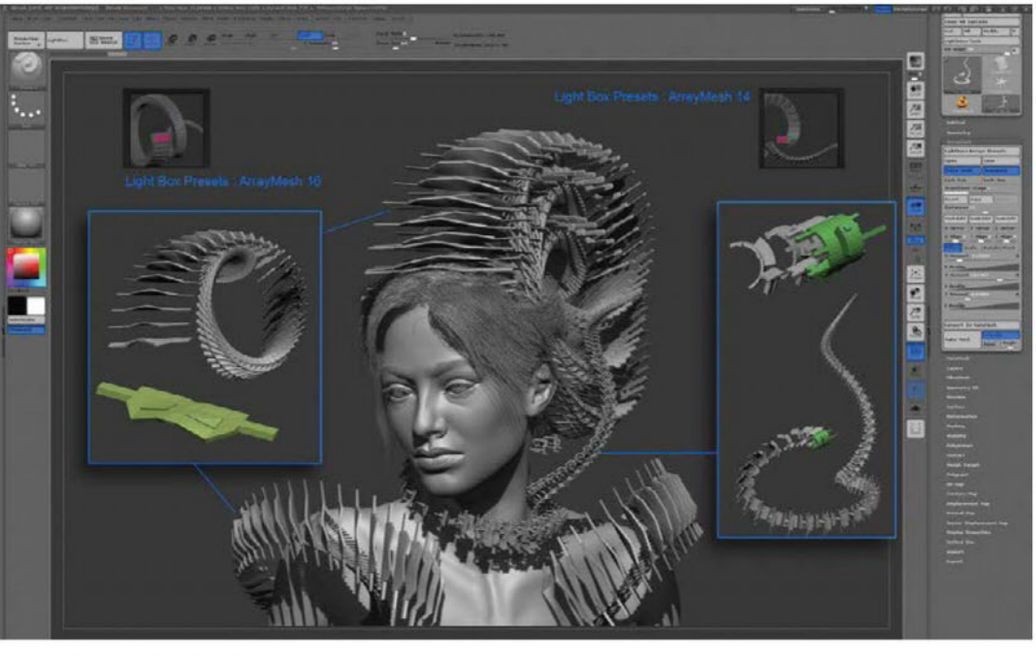
The new Bridge brings KeyShot to ZBrush easily. KeyShot is so wonderfully simple to use and its photographic rendering quality really is mind-blowing. It's like having a mini photography workshop for renders on your desktop. You are able to set up a scene with a few clicks, light it with HDRI maps, create your own light sources and borrow from a vast archive of realistic materials: glass, metal and stone, for example.

Transferring around 24 million tris presented no problem. We could also still edit the model in the scene and preview the changes in real-time. Some of our tests involved as much as 100 million tris – and though the MacBook Pro with a quad-core processor used to test the software started to make noises, it didn't choke.

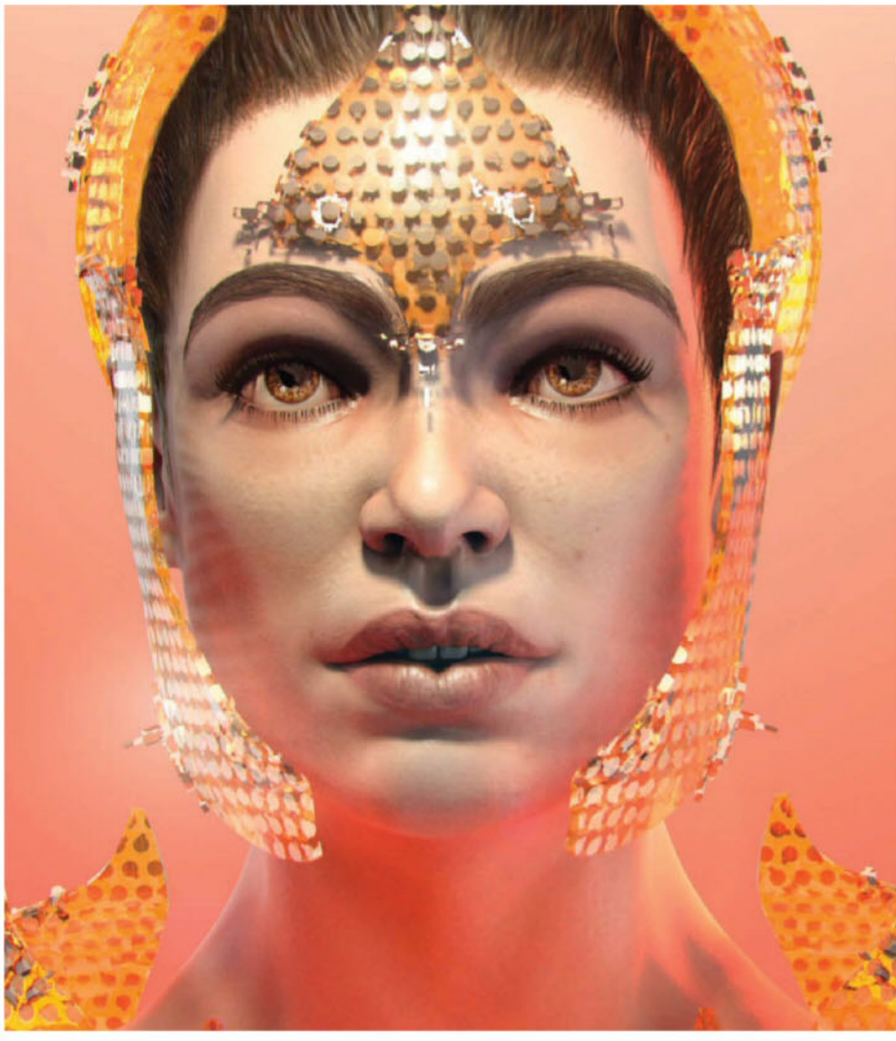
KeyShot Bridge transfers everything we need for previewing our work in KeyShot: all edits and deformations of the object, materials and PolyPaint. If we decide to work on textures in Photoshop – that's not a problem. The Bridge will transfer our UV with maps included as well. This KeyShot to ZBrush plugin will excite many enthusiasts. Folks who work in visual arts, marketing and sculpting, who wish to see their creations in daylight (or rather KeyShot light), are going to love this thing. The special version of KeyShot has a simple and intuitive interface too. Compared to other renderers, it's like playing with a toy. The more we work within it, the more we cherish this feature. Simplicity really is a beautiful thing. As mentioned previously, the material archive in KeyShot is huge. We can also enrich any material that we've exported from ZBrush by adding in new settings and creating our very own resources this way. Our personal favourite is a mix of SkinShade 4, PolyPaint and Translucent, and these work wonders when used for skin texturing. We can use materials for lighting the scene and KeyShot has a Light widget, which contains – you've guessed it – materials that work with lighting just like they do in photography studios. We define the shape of the light using simple objects that can be created in ZBrush.

With ZModeler we were rather skeptical. What do we need ZModeler for if we have GoZ? We can always create the object in another program anyway and export it later. The truth is that after a few hours of fun with ZModeler, we forgot about GoZ entirely. Model editing is a pleasure with ZModeler. The simplifications are great: we can control the grid direction by using the tip of our pen and the menu is hidden under the space-bar. ZBrush's programming team have created new tools with the user's workflow in mind and have made sure that the interface isn't 'in your face'.

**BELOW** Example of using the ArrayMesh tool, which can create new meshes very quickly



> Transferring around 24 million tris presented no problem. We could still edit the model in the scene and preview the changes in real-time



**LEFT** Example of using the NanoMesh tool for cloning some light elements on models. Renders were done in KeyShot

**TOP** These scenes were created using the ZBrush to KeyShot Bridge, a plugin that enables a one-click solution for previews

**ABOVE** This image, titled Connection 5, is an example of work created using ZModeler. It was rendered in KeyShot

**LEFT** Most of the traditional tools were used to create this piece, some of the smaller pieces of face jewellery were created using ZModeler. The render was done in KeyShot

**BELOW** The 64-bit version of ZBrush is more powerful than ever, creating finer details and making more complex models

The head model base in the top-right was made entirely in ZModeler, and this is a fine example of the tool's possibilities.

ZModeler is also useful when it comes to creating very technical or mechanical-looking objects like robots, spaceships and pieces of hardware, for example. But sculptors will find it handy, too. It saves a lot of time and a whole lot of tedious manual retopology. And speaking of retopology – we have to point your attention to the new ZRemesher 2.0 which now provides automatic removals of spirals, giving better retopology results.

NanoMesh and ArrayMesh, on the other hand, are really innovative additions when it comes to tool programming. Object cloning and object editing become very easy tasks and they are a fine exercise of a 3D artist's imagination too. Using NanoMesh we can create really incredibly detailed objects like different types of hair, tree bark, stone buildings and more.

> ArrayMesh is similar to NanoMesh except that we can use it to define different path shapes of clones, for example a circle or a spiral

NanoMesh also contains a lot of options like scale, the angle of the sample positions, and the offset from the base of the object – just to name a few. But the most important thing is that we can still work on a sample model after using NanoMesh. ArrayMesh is a similar tool with the exception that we can use it to define different path shapes of clones, for example in the shape of a circle or spiral.

The 64-bit option is a new addition and will be the standard for all future ZBrush versions. Processing speed has been doubled and DynaMesh has a 4096 resolution now. We haven't done any detailed benchmarks when it comes to how many polys a mesh can have in 64-bit, but working on a 40 million polygon object wasn't a problem at all and all of the tools worked perfectly.

**Piotr Rusnarczyk**

## Essential info

| | |
|---|---|
| **Price** | $795 USD, KeyShot for ZBrush bundle $249 USD |
| **Website** | pixologic.com/zbrush |
| **OS** | Windows Vista and up, Mac OS X 10.7 and up |
| **Memory** | 2048MB for multimillion polys, 6GB recommended |
| **HDD** | 16GB recommended |
| **Graphics tablet** | Wacom compatible |
| **Monitor** | 1280 x 1024 recommended |

## Summary

★★★★★ **Features**
★★★★★ **Performance**
★★★★★ **Design**
★★★★★ **Value for money**

## Verdict ★★★★★

**ZBrush 4R7 is more than an upgrade, it's a look into the future and version 5.0. The new tools raise productivity and the artist's imagination too**

# QUALITY. INNOVATION. RESPECT

www.gamestm.co.uk

THE BLOCKBUSTER GAMES YOU'RE NOT PLAYING
gamesTM
PS4 AND XBOX ONE HOT NEW GAMES
METAL GEAR SOLID V
PLUS
DOES STEAM HAVE TOO MUCH POWER?
"Steam is in a position to rewrite the market rules entirely"
50 BEST DEVELOPERS
LEAGUE OF LEGENDS
THE FUTURE OF TOTAL WAR
PS4 AND XBOX ONE EVERY BIG RELEASE
NINTENDO FIGHTS BACK
FAR CRY 4
SUNSET OVERDRIVE
SUPER MARIO 3D WORLD
ZELDA

Available from all good newsagents and supermarkets

## ON SALE NOW

■ Steam uncovered ■ 50 best developers revealed ■ Metal Gear Online intel

# BUY YOUR ISSUE TODAY

**Print edition available at www.imagineshop.co.uk**

**Digital edition available at www.greatdigitalmags.com**

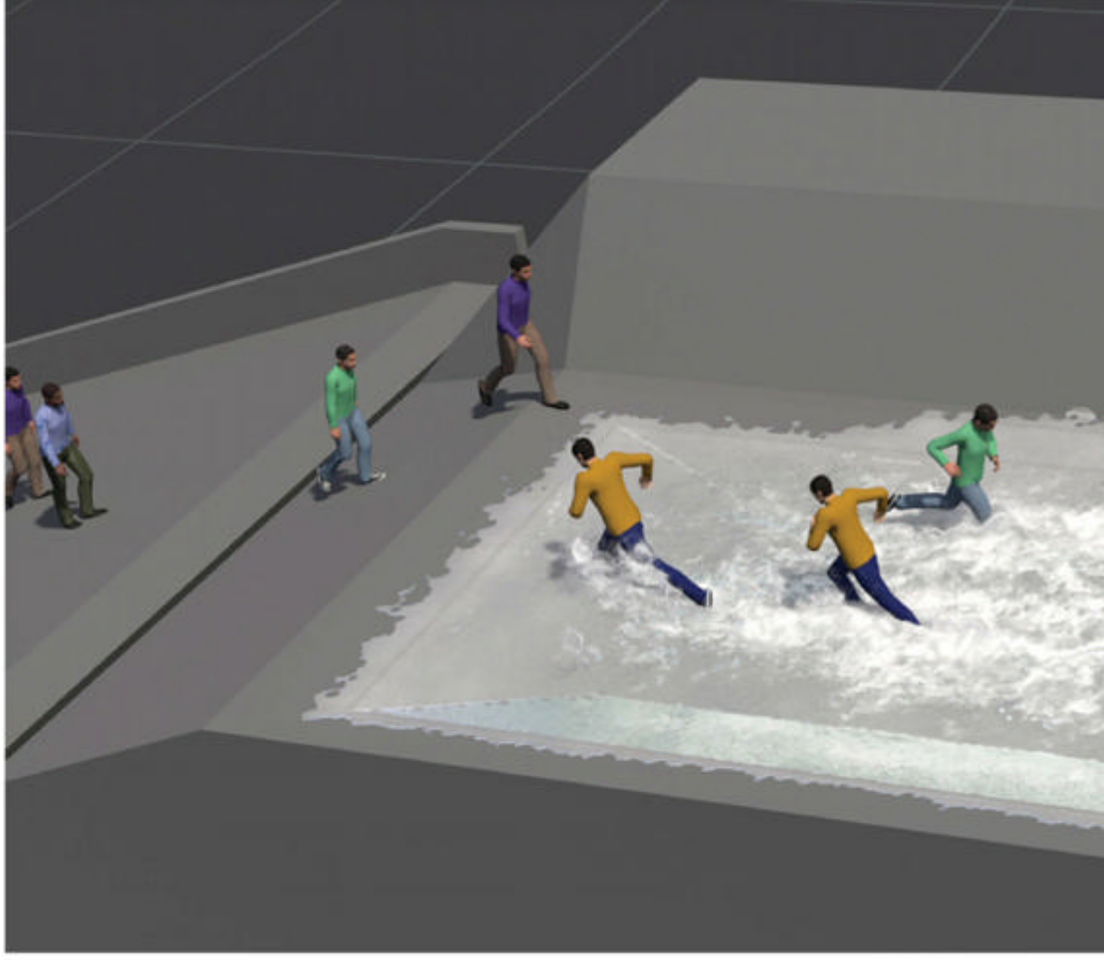
Available on the following platforms

Print | Tablet | Phone | Desktop

facebook.com/gamesTM twitter.com/gamesTMmag

# Houdini 14

## Side Effects' latest release comes with tons of new features and performance enhancements

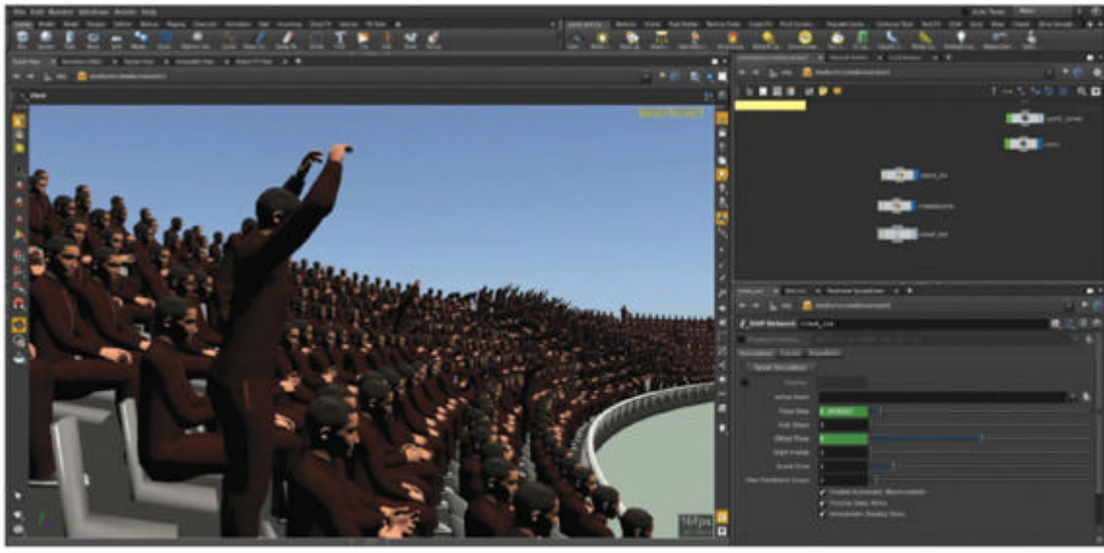


In mid-January, Side Effects Software released the latest version of its 3D animation and visual effects package with a wealth of fresh and enhanced features, improved scalability and optimised performance.

Houdini 14 comes with new Position-Based Dynamics (PBD), which is a multiphysics environment ideally suited to the creation of sand in different forms. Since it exclusively relies on VEX-based operators, it is fully multithreaded, eminently parallelisable and it can run on the CPU or on the GPU using OpenCL. In addition to sand effects it can be also used to create solids, sheets or tethers to generate soft body, cloth and wire-like simulations. It is fully integrated into the DOP's context using particle nodes and is thus able to interact with all other dynamic elements and forces in the scene.

The new crowd system uses a Finite State Machine solver for creating simulations with controls for crowd layout, steering, collision avoidance, terrain adaptation, motion blending and look-at targets. Side Effects has implemented a new packed agent primitive type, which has a seamless conduit to Houdini's Mantra renderer and hardware accelerated display of instanced crowds. Users can also make use of the artist-friendly shelf tools to create basic as well as complex crowd behaviours if they wish.

This crowd pipeline is intended primarily for large, mid-to-background, non-interacting crowds that are executing basic behaviours. It can seamlessly interact with all the other dynamic elements in Houdini, such as rigids, fluids, gases or sand. Side Effects will enhance this pipeline in future releases of Houdini so that it can support more complex agent interactions and AI for creating higher quality crowds.



With Houdini 14, a great deal of work has gone into improving the user experience. From preselection highlighting to new handles, improved edge-loop selection, new UV Flatten and UV Layout tools with UDIM support, grooming tools for hair and fur, custom panels and much more, this release will make it easier for artists to work procedurally. It also benefits from faster playback, fast and accurate snapping, and higher quality geometry display in both 2D and 3D viewports.

The new data visualisation architecture replaces the existing custom display of attributes and guides framework – it is HDA, render-hook friendly, HOM scriptable and has support for all data types. Animators will appreciate the new, faster Animation Editor with Animation layers and significant speed improvements to the display and playback of their rigs.

Houdini's VEX scripting language now has expanded support for strings, groups, arrays, struct and classes. With the back-end optimisations users can see great speed improvements.

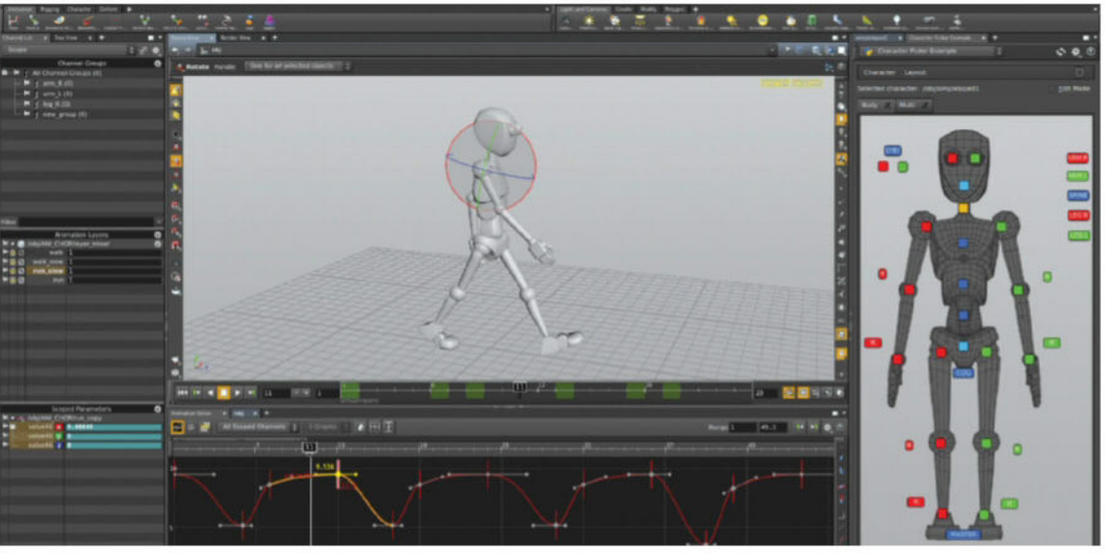
The FLIP Fluid and Ocean FX tools continue to evolve. The FLIP solver has excellent collision behaviour with deforming geometry. Viscosity calculations now use OpenCL and they are much faster and higher quality. The smoother fluid volumes and surfaces result in a cleaner look without loss of detail. Secondary element creation has been improved too, like whitewater with volumetric foam and the ability to simulate in a distributed fashion using new shelf tools.

Other previously existing dynamic solvers were improved as well. The Bullet solver is now ten to 20 times faster and uses multithreaded collision detection, handling initially overlapping objects faster. The Finite Elements Solver (FEM) also has a lower memory footprint and better performance.

In this release, Side Effects did a great job of helping the artists with learning this complex package. Houdini 14 includes a number of new quick-start tutorials. These are short introductory lessons designed to get an artist started with a tool. Longer project-based lessons are available on the Side Effects website in the Learn Section.

Houdini 14 can be downloaded from sidefx.com immediately. The base price includes one year on the Annual Upgrade Plan, which provides production-level support and access to daily builds and dot releases. The limited commercial Houdini Indie is also available for $199 per year and the free Houdini Apprentice Edition is available for students and artists who want to explore the new features.

**Gustav Melich**



**TOP LEFT** The crowd system comes with hardware-accelerated display

**TOP RIGHT** The new, simplified Animation Editor UI is much more intuitive

**RIGHT** With Position-Based Dynamics artists can create solids, sheets or tethers

> Animators will appreciate the new faster Animation Editor with Animation layers and significant speed improvements to the display and playback of their rigs

**MAIN** Houdini 14's new crowd system uses packed agents, which Houdini handles very efficiently and can be easily used for large-scale simulations

**BELOW** Using PBD artists can create realistic-looking soft body simulations with efficient stacking

## Essential info

| | |
|---|---|
| Houdini | $1,995 USD |
| Houdini FX | $4,495 USD |
| Houdini FX Indie | $199 USD / year |
| Houdini Engine Indie | $99 USD / year |
| Houdini Apprentice Edition | Free |
| Website | www.sidefx.com |
| OS | Windows 7 SP1, 8 or 8.1 (32- or 64-bit), 64-bit Intel-based Mac with OSX 10.8 and up, Linux 64-bit only, gcc 4.8 is strongly recommended |
| CPU | Recent AMD or Intel processor |
| RAM | Minimum 4GB |
| Disk space | Minimum 1GB free |
| GPU | GL3 compliant |

## Summary

★★★★☆ **Features**
★★★★☆ **Performance**
★★★★☆ **Design**
★★★★★ **Value for money**

## Verdict ★★★★☆

Houdini 14 brings lots of exciting new features and improvements which makes it a very valuable purchase for every VFX artist

# Subscribe today and get 5 free issues*

Special offer for US readers

## DON'T RISK missing an issue

Subscribe today and save $$$

- Subscribe and pay just $126 for 13 issues
- Receive the mag before it appears in the shops
- Get each issue for as little as $9.69 (usually $14.99)
- Never miss an issue

Non-US readers turn to page 72

3DArtist

To order by telephone, call
+44 (0) 1795 592951
and quote the code USA2

To order online, visit
www.imaginesubs.co.uk/tda
and enter the code USA2

This is a US subscription offer. You will actually be charged £80 sterling for an annual subscription. Your subscription will start from the next available issue. This offer expires 31 March 2015. *5 free issues refers to the USA newsstand price of $14.99 for 13 issues which comes to $194.87, compared with $126 for a subscription.

***Samurai***
Hasan Bajramovic

# The Hub

**The inside guide to industry news, studios, expert opinion and community**

**086** Community news

## Student Awards

We take a closer look at the CG Student Awards

**090** Industry news

## Oculus VR

We reveal Oculus's new VR studio and its plans for the future, as well as a look at some exciting new 3D printing developments

**092** Industry insider

## Christopher Dormoy

Chris McMahon sits down for a chat with the Ubisoft art director about his career

**094** Social

## Reader's Gallery

The latest images created by the **3dartistonline.com** community

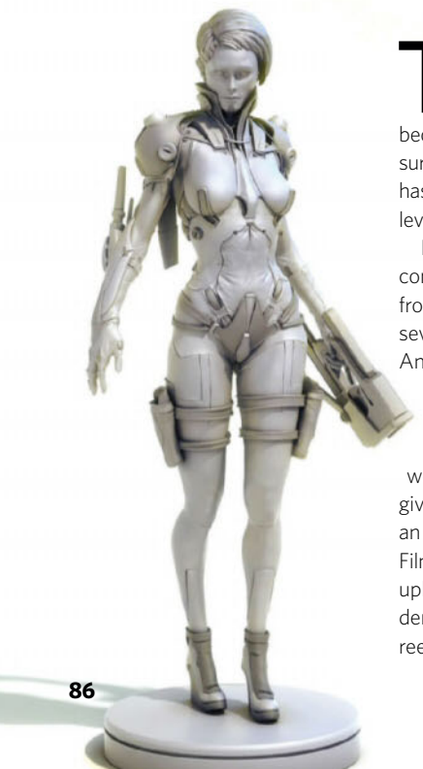


To advertise in **The Hub** please contact Simon Hall on **01202 586415** or **simon.hall@imagine-publishing.co.uk**

Rock Fist by Indonesian born artist Bernhard Sitompul, who took a Diploma in 3D Modeling at 3dsense Media School Singapore

# Win over $350,000 worth of prizes

## Submit your imagery, demo reel, or even short film to get ahead in the industry with this year's CG Student Awards



These days it's argued that many newcomers – even in the CG industry, which is renowned for being meritocratic – will be at a major advantage simply because they have the extra money or support from family to survive working that first city job. The CG Student Awards has changed everything, providing a refreshing new way to level the playing field.

Now in its sixth year, the Autodesk-sponsored online competition allows current students as well as recent alumni from all over the world apply. Work can be submitted to several categories, including Student of the Year for VFX/Animation and Student of the Year for Next Gen Gaming, before industry experts judge each project to ultimately select a winner.

For the very first time, the CG Student Awards judges won't just be looking at final images. The 2015 Awards will give competitors the opportunity to submit video projects as an individual or as a team within several new categories like Film of the Year for any shorts and Game of the Year for uploaded gameplay. Applicants can even submit traditional demo reels. "We are going to be reviewing over 1,000 demo reels so it's important to get it right," explains Alwyn Hunt, one of the primary organisers behind the event. "Make sure your best work goes first and that the reel is no longer than three minutes, with nicely timed turntable renders on a grey background, no overbearing soundtracks, good supporting images and a clear breakdown of what you've done."

Everybody who decides to enter this amazing competition will be receiving a six-month Creative Cloud licence courtesy of Adobe, a one-month subscription to Digital-Tutors, and six months of completely free hosting for a portfolio website at SiteGround. These prizes are worth $96 (£63) altogether. For the final winners and runners-up, the available prizes will be even more mouthwateringly good with over $350,000 (£231,221) worth of goodies to be won. Also up for grabs is the chance to win the opportunity of a lifetime: 25 paid internships at major VFX studios including Framestore, Double Negative, The Mill, MPC, Method Studios, NetherRealm Studios and Monolith, with accommodation included for many.

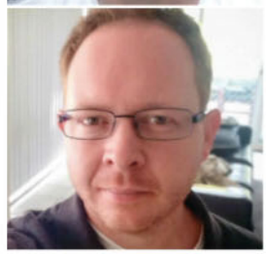
At the time this magazine goes to print, the CG Student Awards will be 24 hours away from officially launching at cgstudentawards.com. For anyone who's thinking of applying, we can only say one thing: there's nothing to lose – so what are you waiting for?!

The 2015 CG Student Awards kicks off on 4 March 2015 and runs until the 19 June 2015. Entries close on the 13 May, and winners will finally be announced on 17 June 2015.

**TOP** For the first time, applicants to the CG Student Awards will be able to submit video projects as an individual or as a team

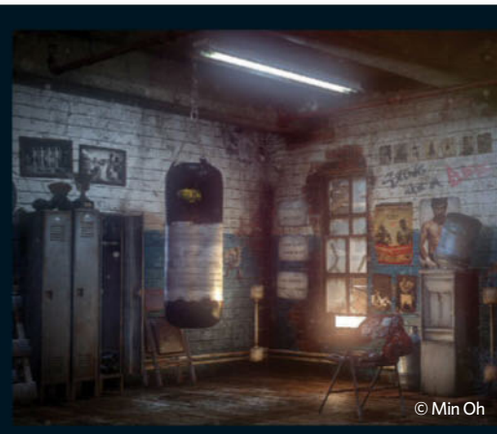
**LEFT** Live-plate integration piece by 3D lighting FX and rigging artist Prashant Verma, who created all elements aside from modelling. Created with various software like Maya, 3ds Max and RayFire

**BOTTOM** Character design work created by Brandon Dunn, who was a finalist in the Next-Gen Gaming category and won an internship at Gameloft in Auckland



**ABOVE** Alwyn Hunt and Andrew McDonald are the founders of the CG Student Awards and they organise it every year

> The moment I checked my email and heard that I had been picked for an internship at Epic Games, I had a bit of a heart attack
>
> **Min Oh, associate technical artist at Epic Games**




# Life at Epic Games

## CG Student Award winner Min Oh reveals what it was like to start working at Epic Games

Last year's Student of the Year winner for the Next-Gen Gaming category was Min Oh, who also won the opportunity for an internship at Epic Games. He initially worked there for a few months, before having the internship extended for another six months. We catch up with him to find out more about how it felt to be a CG Student Award winner and his work today.

**How did it feel when you were told you'd won the internship at Epic Games?**
The moment I checked my email and heard that I had been picked for the internship at Epic Games, I had a bit of a heart attack. I couldn't believe what I was reading. After I self-confirmed that I wasn't hallucinating, I messaged my best friend who used to play *Gears Of War* with me. I said, "Dude, I'm going to work at Epic Games!" His response was not appropriate for magazine publication...

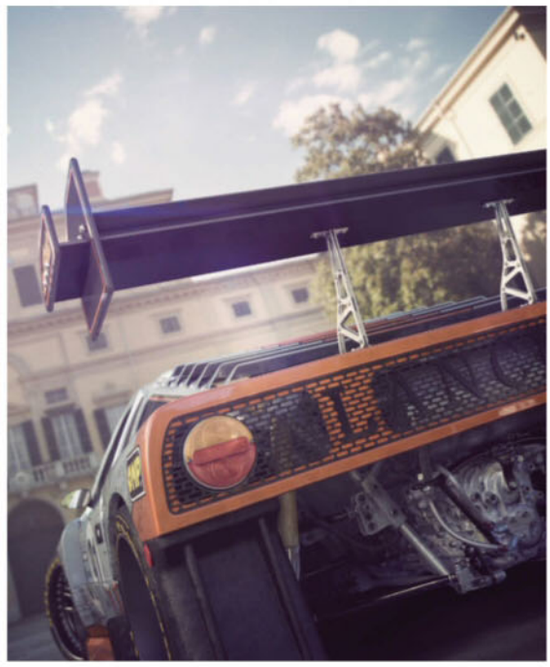
**What was the best part about working there?**
At first the facility was fascinating to me, but as time goes by I have realised that it's the people at Epic that make it such a great place to work. Everyone is so talented and knowledgeable, you learn so much working here – it's stuff you can't learn in school. They make the most cutting-edge game engine and they make great games.

**Could you tell us more about what you're doing today?**
I just got a full-time job offer from Epic Games. One of my longtime life goals has come true. I'm very excited to continue to work here and hopefully soon enough I will present another good piece of my work to you.

**What advice would you give to students thinking about entering the CG Student Awards this year?**
I'm sure there are tons of students who are more talented than me. I find these things helped me a lot:
• Try to find a friend or mentor to provide feedback. Take that feedback to improve yourself and your work.
• Trust yourself, be consistent, and most importantly, never forget that you love computer graphics. Enjoy it!

# The winning standard

## The three winners of Humster3D's Most Legendary Car Render competition reveal their secrets for making incredible CG vehicles



### 1ST PLACE
### ERNEST KOSKA, JEEP WILLYS

- First of all – detail. Every element you add to your project makes the render more realistic. That's the first rule for a new model.
- Make use of masking when rendering. This speeds up the whole process of postproduction and makes your life easier.
- Use 32-bit files as much as you can. Everything for the Jeep Willys piece was rendered to 32-bit full-float EXR that gave amazing control on every element throughout the postproduction process in Photoshop.
- Last but not least, remember postproduction and how important this process is in artwork creation. Use rendered passes, combine and have fun with them!

### 2ND PLACE
### ANDREA LAZZAROTTI, LANCIA MEETING

- Recycle. For Lancia Meeting I used some of my old models, which were low poly, but were useful as a base to then completely remodel all the cars more quickly.
- Often you never know what part of the car will fill the frame of the camera, so it's always good not to overlook any detail. Even the lights need to be modelled from the inside for a much more realistic look, especially in the case of a rendered close-up.

### 3RD PLACE
### KEVIN BOULTON, MY CHILDHOOD PERSPECTIVE

- Get as many references as you can find. The process of any model that I create begins with a mass of reference.
- If you have spent time modelling small details, show them off as best you can. You have created them to be seen after all.
- Follow accurate GA drawings of the car shape and just spend time getting them as perfect as you can. The longer you spend on the early stages, the better that your final image will look.
- Get excited by what you're doing and carry your drive into the model. If you're excited by it, the model will show that in the end result.

**TOP** "Five years from now I hope to touch the models I create on the computer by buying a printer and a 3D CNC milling cutter," says Lazzarotti. He reveals that he would even one day consider creating true 3D car parts with the technology

**MIDDLE** "The 3D modelling for this piece was completed using 3ds Max and the render came from mental ray," explains Boulton. "The lighting setup consisted of one mental ray Sun and supporting photometric lights to create a realistic look. This enabled the final render to have clean, sharp details"

**BOTTOM** "Working on the Jeep Willys piece was really fun," first-prize winner of the competition, Ernest Koska tells us. "I used 3ds Max 2014 and V-Ray 2.4 for modelling and rendering. I didn't use any special plugins on this project. Everything was made with simple poly/spline modelling"

# If Apple made a magazine

www.icreatemagazine.com

Mac, iPad & iPhone
FREE PIXELMATOR 3.3
SOFTWARE WORTH $29.99
iCreate
EXCLUSIVE FREE SOFTWARE
PIXELMATOR
GET THE POWER OF PHOTOSHOP FOR FREE TODAY
EXPERT TUTORIALS · Brushes · Layers · Adjustments · Vectors · Effects & more
FULLY FEATURED APP WORTH $29.99
CUSTOMISE TOUCH ID
20 WAYS TO IMPROVE iTUNES 12
BACK UP YOUR CAMERA ROLL
SET UP INSTANT HOTSPOT
FREE Mac, iPad & iPhone
iOS 8 SECRETS...
ULTIMATE iPHOTO GUIDE
HEAD-TO-HEAD iPHONE 6
Mac, iPad & iPhone
5 REASONS YOU NEED WATCH
GET THE PERFECT AUDIO SETUP
HAS APPLE RUINED THE MAC MINI?
FREE 2GB OF VIDEO TIPS, FONTS AND ICONS
Boost battery life
MASTER iCLOUD DRIVE
THE BEST MAC EVER?
CREATE A CALENDAR
FREE DOWNLOAD
GET FIT WITH iOS 8
CREATE YOUR OWN LOOPS
EDIT WITH EXTENSIONS

iCreate

ON SALE NOW

• Free Pixelmator download & masterclass • 20 ways to improve iTunes 12

EVERY ISSUE • FREE RESOURCE DOWNLOADS

Available from all good newsagents and supermarkets

# BUY YOUR ISSUE TODAY

Print edition available at www.imagineshop.co.uk

Digital edition available at www.greatdigitalmags.com

Available on the following platforms

Print Tablet Phone Desktop

facebook.com/icreatemagazine twitter.com/icreatemagazine

The team are still learning their way around the new medium combining VR experiences for cinematic ones

# Oculus creates in-house film studio

## Top industry creatives are working together to finally bring virtual reality to cinemas

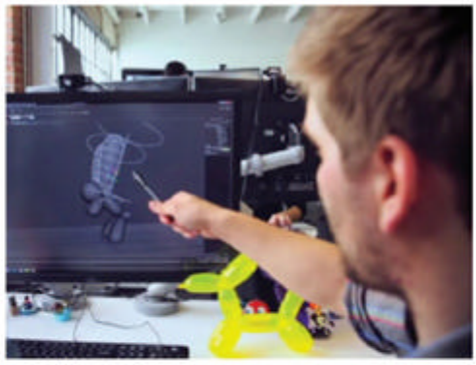
The team at Oculus has just taken an important first step towards bringing virtual reality to film-making with Oculus Story Studio, an internal project involving a collection of artists and technicians dedicated to exploring what VR in cinema could really be for the first time.

"A year ago, those of us at Oculus Story Studio were on different career paths working in computer animated films and story-driven games," explained Oculus Story Studio's supervising technical director, Max Planck, on the official blog for the new group.

"Like most creators and artists who have seen modern virtual reality, we knew this emerging platform was not just a new gaming device, but a powerful new medium. So we changed course, quit our jobs, and started down a path of using this medium to immerse the audience into fantastic worlds and deeply meaningful stories using realtime rendering."

Already, Oculus Story Studio has involved the completion of one short film VR experience – a real-time animation called 'Lost' by Saschka Unseld, the former Pixar director behind 'The Blue Umbrella'.

A slate of five films from the Oculus Story Studio team are set to come out later this year alone. Learn more at www.oculus.com/storystudio.



A group of former Pixar, ILM, gaming developers and more are now a part of Oculus Story Studio

# Microsoft develops AR headset

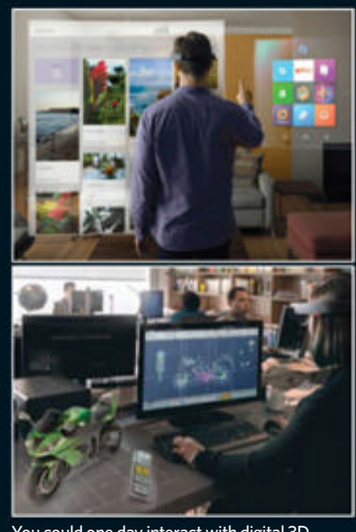
## The company's new innovation will make use of holographic computing

Microsoft has announced a new augmented reality headset that might change the way we interact with the digital world for good: HoloLens. By tricking the human brain into seeing light as matter, HoloLens will enable users to see and interact with realistic holograms for the first time, no matter where they are. Digital images such as 3D models will be able to be seen as though they are real objects in the room, with no wires or further computers required.

Microsoft has reportedly said it expects consumer models of the HoloLens to be released within the same timeframe as Windows 10: sometime later this year.

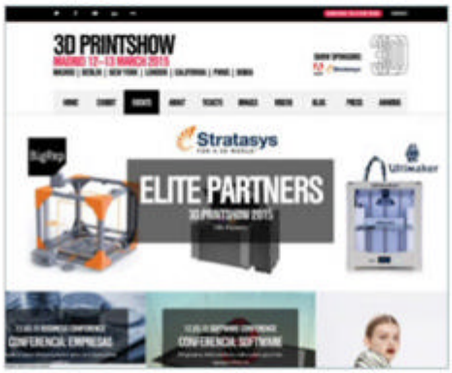
Augmented reality is becoming a more exciting prospect every day, especially with new technology like HP's Zvr holographic display being announced at CES earlier this year.

Learn more about the HoloLens at **www.microsoft.com/microsoft-hololens/en-us**.



You could one day interact with digital 3D models sitting on your desktop as though they were real with Microsoft HoloLens

**HAVE YOU HEARD?** DreamWorks announced the closure of its PDI/DreamWorks facility and cut 500 jobs




This year's first 3D Printshow event kicks off on 12 March in Madrid. Learn more about the other locations and buy tickets at **3dprintshow.com/printshow-tickets**

# Printshow 2015

### Experience desktop 3D printing like never before with the world's largest, dedicated 3D printing event

Now in its third year, the 3D Printshow is bigger than ever before and coming to Madrid, Berlin, New York, London, California, Paris and Dubai, from March to November 2015. From looking at 3D printer makers and exhibitors to an art gallery and conferences on jewellery, design, and even a 3D Printshow Kitchen for 3D printed food, it's definitely an event not to be missed for anyone excited about this rising industry. Find out more at 3dprintshow.com.

# Strooder manufacturing begins

### After a successful Kickstarter campaign, OmniDynamics unveils its 3D colour filament maker

OmniDynamics has officially announced the start of manufacturing on the Strooder: a new filament extruder that will enable users to create any colour filament they wish from raw plastic material in the form of pellets. Aside from being able to provide the 'ink' that would let 3D printers create objects in any mixed colour the user wants to print in, the Strooder would also be a much cheaper way to create filament. Currently manufactures charge an impressive mark-up of up to 1200 per cent on the printing plastics in some cases.

OmniDynamics have improved the overall performance on the original Strooder from Kickstarter, it now reaches extrusion speeds of up to three meters per minute

Jewellers looking to get started using Shapeways to simply 3D print or even sell their products should visit: **www.shapeways.com/getting-started/jewelry**

# Shapeways reveals new precious metals

### 3D prints available for purchase, made in 18-carat gold, platinum and other materials

Jewellery designers and buyers all around the world will now have much more to choose from with 3D printed jewellery thanks to Shapeways, which has just launched platinum, 18-carat gold, 14-carat rose gold, and 14-carat white gold for 3D printing with the addition of a new suite of metal materials. Metals are 3D printed using a wax-casting process, where the model is first 3D printed in wax, then turned into a mould using liquid plaster. Molten metal is then poured into this mould and set to harden before the product is hand-polished to give it a metallic finish.

# Software shorts

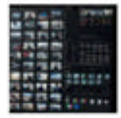
Bringing you the lowdown on product updates and launches

### Maxwell V3.1

The full public release of Maxwell V3.1 is now available as a free to upgrade for all V3 customers. New features include a new emitters workflow for full Spotlights support, extra Sampling to save on render time, and more options for volumetrics. The Maxwell team also added a camera white balance, and simple animation tools in Studio. Learn more at **www.maxwellrender.com**. Image by Mihai Iliuta.

### Amplify Creations – Multi-Tile UV Bake tool

Perfect for any architectural, product pre-vis and videogame workflows, the new Multi-Tile UV Bake Tool lets you batch bake multi-tile texture collections into common multi-tile naming conventions such as MARI UDIM, Mudbox and ZBrush. Exclusive offer for **3D Artist** Readers: use the code AMPLIFY3DARTIST for 30 per cent off at **amplify.pt/tools/multitilebaketool**.



### DaVinci Resolve 11.2

Blackmagic Design has announced the availablility of DaVinci Resolve 11.2, which adds improved CinemaDNG RAW image processing with new soft clipping features, improved round trip workflows and more. The new update is available to download free of charge for all DaVinci Resolve customers from the Blackmagic Design website **www.blackmagicdesign.com**

**DID YOU KNOW?** Netflix is in the early stages of developing a remake of The Legend Of Zelda franchise as a live-action series

**Job** Art director

**Education** Certificat from École Nationale des Beaux Arts, BAC Design at Concordia University

**Website** www.dormoy.ca

**Biography** Dormoy started out working at a printer shop in 2001 where he learned the basics of typography and design layout. He then moved on to work on print creations at an agency, and then to the Sid Lee agency as designer/art director in 2005. In 2012 he moved to Ubisoft, where he currently works on the brand identity of franchises.

**Portfolio Highlights**

**2015** *Tom Clancy's Rainbow Six Siege* – art direction of identity

**2014** *Far Cry 4* – art direction of identity

**2014** *Assassin's Creed Unity* – art direction of identity

**2012** *Assassin's Creed III* – art direction of identity

**2009** *Marina Bay Sands* – design/art direction for website of a new hotel in Singapore

**2008** *Cirque du Soleil* – redesign/art direction of website and microsites

**2007** *Cirque du Soleil* – art direction of new campaign for casting

**2006** *MGM Grand* – redesign of website

**2004** *Club Med* - print ad design series

**2003** *Ferrari Quebec* – print ad design series

Images 01 & 02 © Ubisoft Entertainment. All rights reserved.

# Christopher Dormoy

Art director, Ubisoft

## The man in charge of Ubisoft's brand identities discusses his drive behind artistic campaigns

Christopher Dormoy was inspired to launch into a career in the arts after being brought up in Switzerland. At the Canadian headquarters of Ubisoft, Dormoy creates brand identities for the developer's biggest releases, including the *Assassin's Creed, Far Cry* and *Rainbow Six* franchises.

"My goal is to develop visual campaigns, videos and identity-based marketing materials," he says. "Whether in interactive or print, I have always been driven to push myself to the limit and to constantly explore new artistic ideas."

Dormoy explains to us how he brings his expertise in art direction to the videogames industry.

**How did you end up working at Ubisoft?**

When I worked at Sid Lee (creative services firm), I learned a lot. From the web to user identity, I touched on many areas in order to increase my artistic abilities. Video, music, photography and graphic design – I experienced and appreciated many areas. But above all, I learned humility and the ability to listen and observe. To grow you need to know how to deal with criticism and questioning of your work while demonstrating humility. This is important at Ubisoft, and the company was looking for an art director who would bring a new artistic approach to its brands. I put forward my talent for multidisciplinary creativity. Videogames is an area that is evolving rapidly using various artistic approaches, so as art director in marketing I have to show my skills in areas such as videos, visuals and identities. Such multidisciplinary skills are a valued asset at Ubisoft.

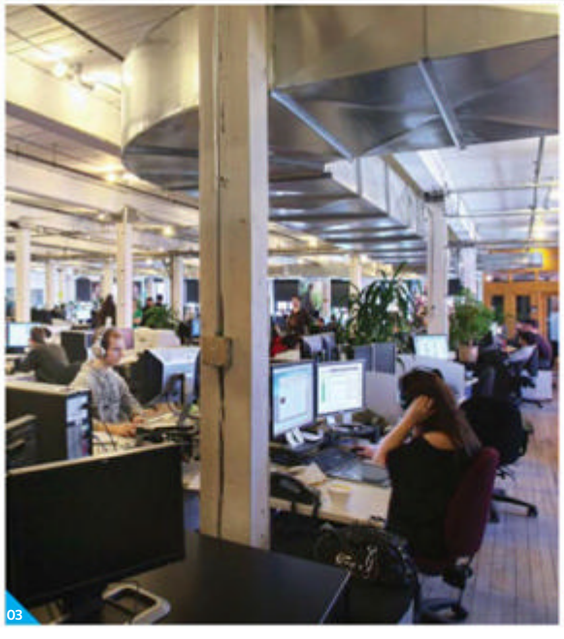
**Can you tell us about your work on *Assassin's Creed*?**

*Assassin's Creed* is the first franchise that I worked on at Ubisoft. It is a rich universe full of stories, cultures and places. As the brand identity was already well established before my arrival, I focused on bringing forth visual compositions with strong and innovative messages. It is not easy to achieve this vision as Ubisoft and this franchise is a huge machine. My main challenge was to evolve how we presented the game and its heroes by providing humanisation, emotion and intrigue.

**What are you main artistic tools of choice and why?**

My main tool is Photoshop. As I am also a photographer, Photoshop has always been part of my artistic environment. Later when I oriented to digital art, 3D and 3ds Max was the next logical step in learning new tools. When working on a visual project I usually blend several artistic disciplines to bring forth the emotion I'm looking for. I often add photography and graphic design to my 3D compositions. Although 3D is an extremely powerful tool, photography brings a certain layer of emotion and natural perception that 3D can struggle to convey. Certain looks, clothing movement, atmospheric effects: these are all elements that I prefer bringing in through photography.

01



03

04

"My main challenge was to evolve how we present this game and its heroes by providing humanisation, emotion and intrigue"

02

## Working at Ubisoft

### Dormoy gives us some insight into the day-to-day life of an art director at Ubisoft

"A typical day starts with good coffee, good music in my ears and the latest news on the games market. Then it's time to work my imagination. I'll meet with the director of the game, the screenwriter, the concept artist and the marketing director to make sure I'm familiar with the world of the game. The goal is to capture its essence and convey a strong and coherent message. Back in my office I often listen to the game's original soundtrack. I'll escape into my ideas and start creating."

**01** "A day at Ubisoft is never boring," Dormoy tells us. "In the Montreal studio, several major franchises are developed. I work on a variety of games, often simultaneously"

**02** "When working on visuals or videos, there are many people involved," says Dormoy. "It's important to stay in constant communication with the modeller, the animator and the 2D and 3D artists"

**03** The offices of Ubisoft Montreal. The large Canadian branch of the company is responsible for a huge amount of videogame franchises, and often acts as the epicentre for a lot of Ubisoft's work

**04** Dormoy has worked on huge Ubisoft titles such as *Assassin's Creed* and *Far Cry*. The next Ubisoft project he has worked on, *Rainbow Six Siege*, is due out in 2015

# Images of the month

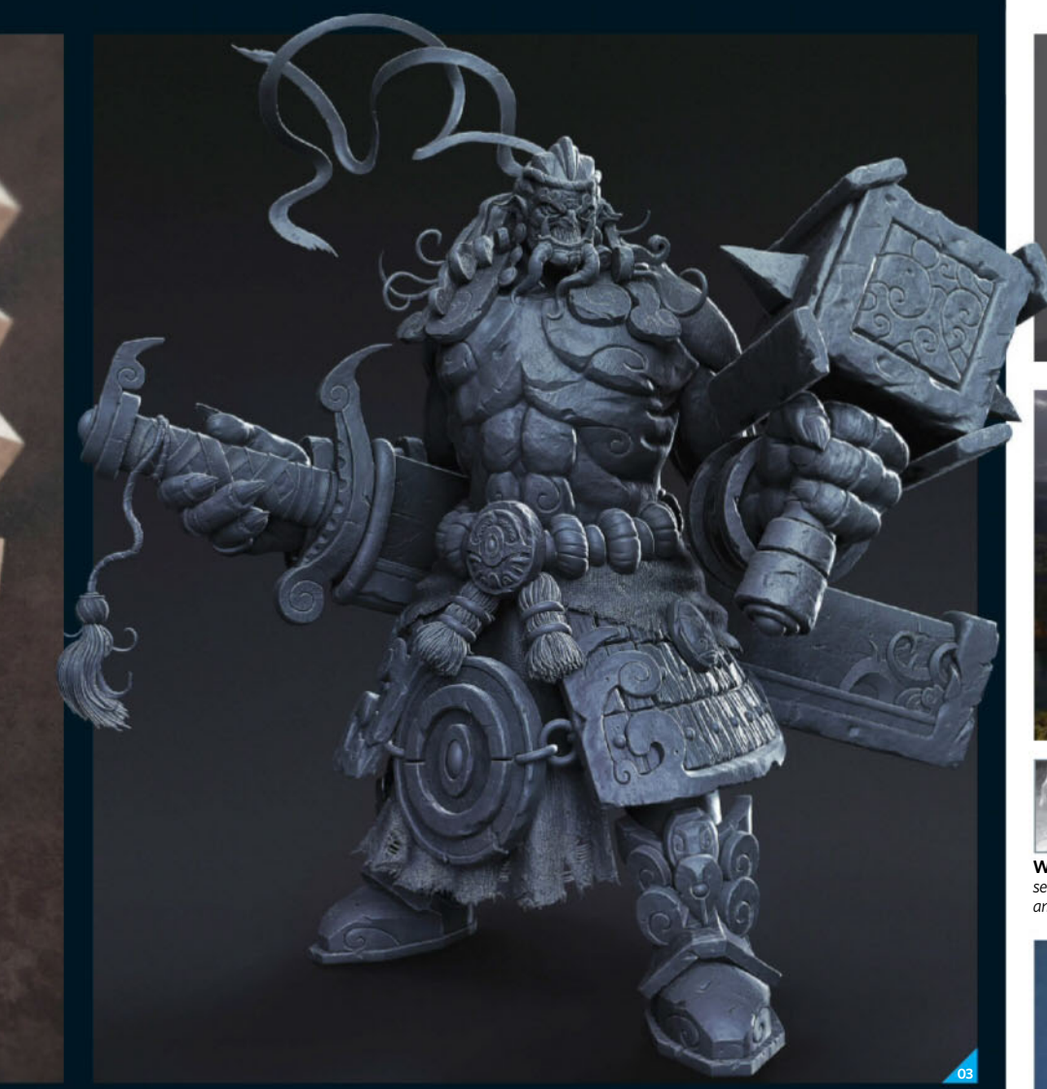
**These are the 3D projects that have been awarded 'Image of the week' on 3DArtistOnline.com in the last month**

**01** Virus
**by Oliver Kieser**
**3DA username DigitalDream**
**Oliver says:** "The image was made with ZBrush 4R7 to test the new features from Pixologic. Rendering was done in KeyShot and postproduction in Photoshop Elements 13."
**We say:** *It's great to finally have ZBrush 4R7 in our grasp, and Oliver has seized the opportunity by creating this incredible image. We particularly like the maze-like orbs.*

**03** World Of Warcraft Fan Art
**by Kieran McKay**
**3DA username Kieran McKay**
**Kieran says:** "This is *World Of Warcraft* fan art, based on a concept by Cole Eastburn. It was sculpted and rendered in ZBrush."
**We say:** *Kieran has brilliantly emulated the* World Of Warcraft *style with this intricate character sculpt. There's a real stone quality to the armour, and we could imagine this as a high-quality in-game asset.*

**02** Living Room in Winter
**by Hassan Jaber**
**3DA username Hassan.jaber**
**Hassan says:** "I tried mixing a modern clean space with rusty, vintage furniture and accessories to achieve an interesting harmony. I used 3ds Max 2014, V-Ray 3.0 and Photoshop."
**We say:** *We love crisp, clean arch-vis and this piece from Hassan fulfils that remit beautifully. The old-fashioned map on the wall is stunning, too.*

**04** Atheris Hispida
**by Valentina Rosselli**
**3DA username Valentina Rosselli**
**Valentina says:** "This piece was modelled in Maya scale by scale with multitiled UVs, painted in MARI and rendered with V-Ray. This project was a study on scales, details and photorealism and it took three weeks to complete."
**We say:** *Look at those scales! There's so much awesome texture work going on here and the eyes are fantastic.*



03

04

## Marcus Aurelius **by Yavuz Selim Balcioglu**

**3DA username Lordlight**

**Yavuz says:** "Marcus Aurelius – Roman Emperor. I used ZBrush for all of the modelling. I spent almost a week for investigating pictures of Marcus Aurelius to gather reference."

**We say:** *You can absolutely tell that Yavuz has taken the time to gather adequate reference material, as his bust is extremely detailed and nicely textured so that it echoes real marble.*

## Sunset **by Vincent Ferrand**

**3DA username vinnie**

**Vincent says:** "This image was all rendered in Vue xStream. The idea here was two-fold: combine a feeling of depth and volumetric lighting in a mountain scene."

**We say:** *Vincent has generated a wonderful landscape in this image. We love to see images like this at **3D Artist**, as they always capture a certain atmosphere and mood. Really great stuff!*

## Smoothie **by Jorge Adrian Fernandez**

**3DA username jorge fernandez**

**Jorge says:** "This is a personal work to test displacement light and composition in 3ds Max. My portfolio is on **www.behance.net/JAF**."

**We say:** *We featured Jorge's incredible smoothie on our social media channels earlier in the month as it is quite special, particularly the texture of the drink itself – juxtaposing froth with glistening bubbles, inside of a smooth glass. It looks absolutely delicious!*

## Beasty Bot **by Pablo Castaño**

**3DA username Ltcdata**

**Pablo says:** "Beasty Bot is a personal project made in 3ds Max, ZBrush, KeyShot, Photoshop and After Effects. I kept an 80/20 balance in colour, detail and texture. I think that one of the most important aspects in an image is composition."

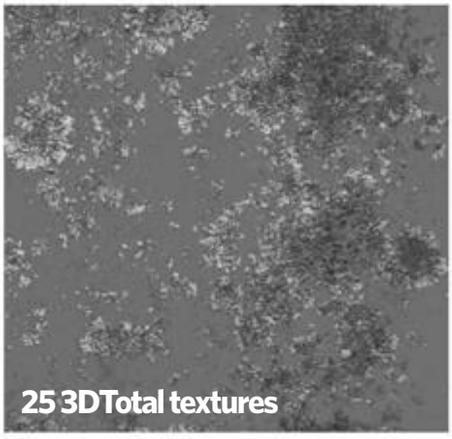
**We say:** *Pablo has come up with a really cool cyborg concept here, with great attention to detail and a neat dystopian aesthetic. The orange wires are a really nice, subtle touch.*

# YOUR FREE RESOURCES

Log in to **filesilo.co.uk/3dartist** and download your 3D resources **NOW!**

**EVERYTHING YOU NEED TO FOLLOW ALONG WITH THE MAGAZINE AND CREATE GREAT 3D ART**

## DIGITAL-TUTORS ZBRUSH VIDEO



25 3DTotal textures

**THIS MONTH'S COMBINED RESOURCE SIZE: 8GB**

CGAxis HDRIs

HitFilm 3 Pro demo version

## YOUR BONUS RESOURCES

**ON FILESILO THIS ISSUE, FREE AND EXCLUSIVE FOR 3D ARTIST READERS, YOU'LL FIND 8GB OF RESOURCES, INCLUDING...**

- Over three hours of expert ZBrush video tuition courtesy of Digital-Tutors
- HitFilm 3 Pro Demo version for Mac and PC courtesy of FXHOME
- Huge 20% discount on Flatiron for 3ds Max from **3D-Plugin.com**
- Premium models from Model+Model
- 25 Textures from 3DTotal
- Premium HDRIs from CGAxis
- Tutorial images, videos and assets

FileSilo

## filesilo.co.uk/3dartist

# FILESILO – THE HOME OF PRO RESOURCES

## Discover your free online assets

- A rapidly growing library
- Updated continually with cool resources
- Lets you keep your downloads organised
- Browse and access your content from anywhere
- No more torn disc pages to ruin your magazines
- No more broken discs
- Print subscribers get all the content
- Digital magazine owners get all the content too!
- Each issue's content is free with your magazine
- Secure online access to your free resources

This is the new FileSilo site that replaces your disc. You'll find it by visiting the link on the following page

The first time you use FileSilo, you'll need to register. After that, you can use your email address and password to log in

The most popular downloads are shown in the carousel here, so check out what your fellow readers are enjoying

If you're looking for a particular type of content, like software or video tutorials, use the filters here to refine your search

Can't find the resource you're looking for in these filters? Click on More Types to specify what kind of resource you want

Green open padlocks show the issues you have accessed. Red closed padlocks show the ones you need to buy or unlock

Top Downloads are listed here, so you can get an instant look at the most popular downloaded content

Check out the Highest Rated list to see the resources that other readers have voted for as the best

Find out more about our online stores, plus useful FAQs such as our cookie and privacy policies and contact details

Discover our fantastic sister magazines and the wealth of content and information that they provide

# HOW TO USE FileSilo

**EVERYTHING YOU NEED TO KNOW** ABOUT ACCESSING YOUR NEW DIGITAL REPOSITORY

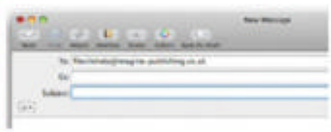
## To access FileSilo, please visit **filesilo.co.uk/3dartist**

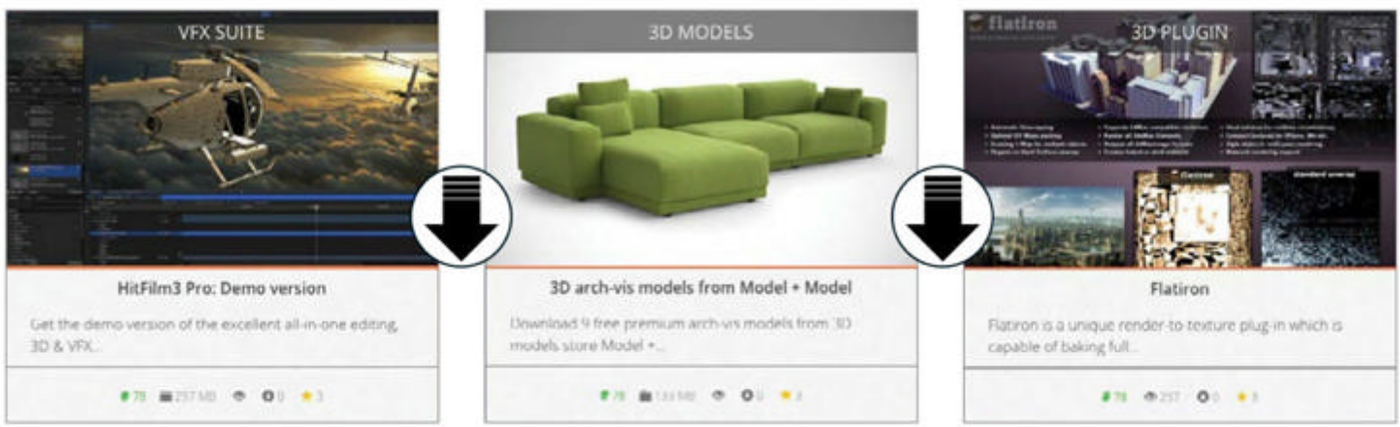
01 Follow the on-screen instructions to create an account with our secure FileSilo system, and then log in and unlock the issue by answering a simple question about the magazine. You can access the content for free with each issue of **3D Artist**.

02 If you happen to be a print subscriber, you can easily unlock all the content by entering your unique Web ID. Your Web ID is the eight-digit alphanumeric code that is printed above your address details on the mailing label of your subscription copies. It can also be found on any renewal letters you receive.

03 You can access FileSilo on any desktop, tablet or smartphone device using any popular browser (such as Safari, Firefox or Google Chrome). However, we recommend that you use a computer to download content, as you may not be able to download files to your phone or tablet.

04 If you have any problems with accessing content on FileSilo, or with the registration process, take a look at the FAQs online or email **filesilohelp@imagine-publishing.co.uk**.



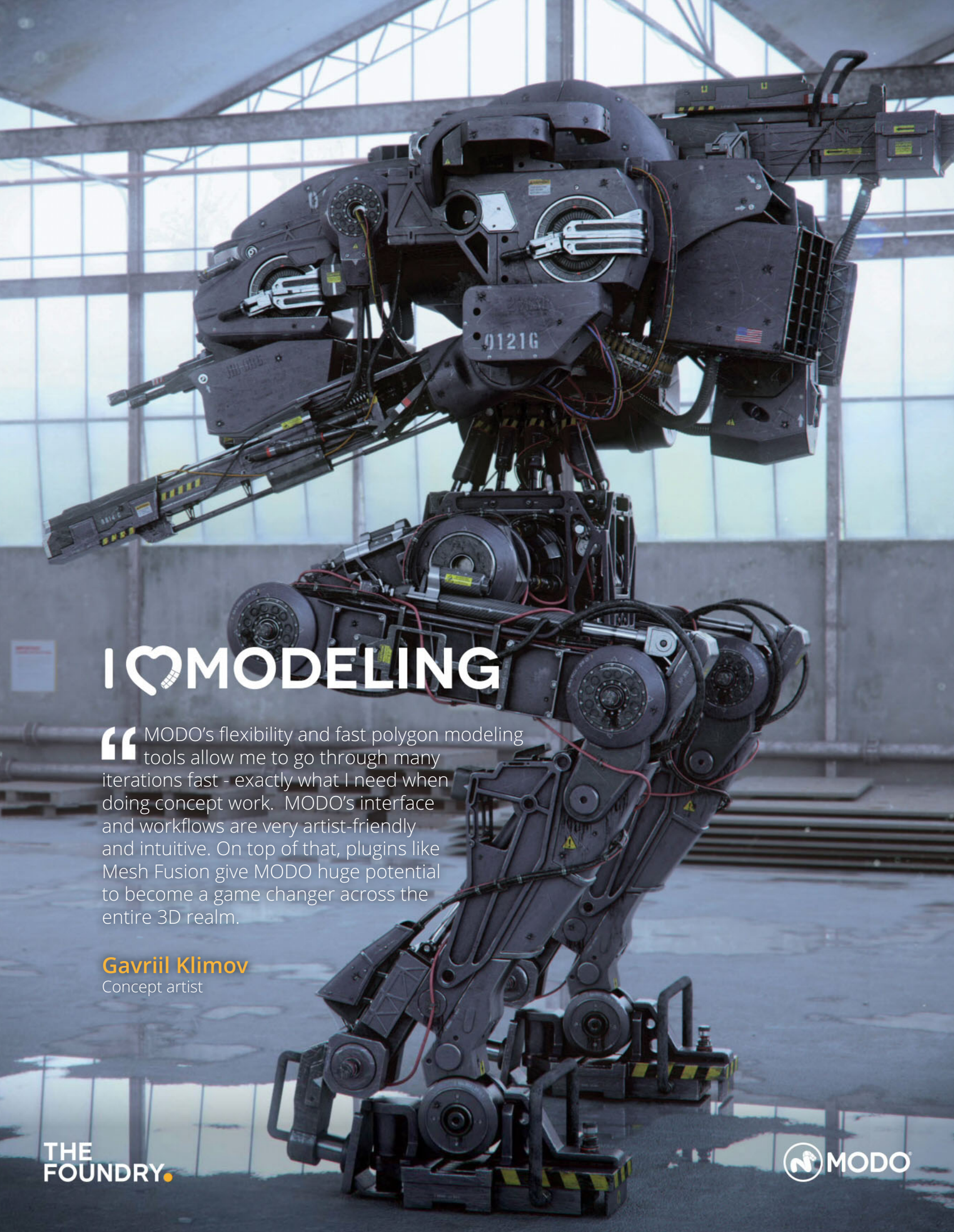



# NEED HELP WITH THE TUTORIALS?

Having trouble with any of the techniques in this issue's tutorials? Don't know how to make the best use of your free resources? Want to have your work critiqued by those in the know? Then why not visit the **3D Artist** Facebook page for all your questions, concerns and qualms? There is a friendly community of fellow 3D artists to help you out, as well as regular posts and updates from the magazine team. Like us today and start chatting!

## facebook.com/3DArtistMagazine

Issue 79 of **3D Artist** is on sale **26 March 2015** from GreatDigitalMags.com




# I ♥ MODELING

"MODO's flexibility and fast polygon modeling tools allow me to go through many iterations fast - exactly what I need when doing concept work. MODO's interface and workflows are very artist-friendly and intuitive. On top of that, plugins like Mesh Fusion give MODO huge potential to become a game changer across the entire 3D realm.

**Gavriil Klimov**
Concept artist

THE FOUNDRY.

MODO®

# The School That Makes Movies!

This is a big deal, because nobody else does it. Sure, students at other schools make student films. And while that sounds fun, few if any will get paid to make their own movies right out of school.

Typically careers in animation, visual effects, or gaming start at studios. At a studio you work as part of a team under competent supervision and creative leadership. We think it makes more sense to train you to do that.

At The DAVE School, our students spend their last 12 weeks working as they would at a studio. They gain practical career experience working in a studio pipeline on a short produced by the school.

We invite you to come to our website to see these films. And now that our first class of gaming students has graduated, you can play our first game! You can also learn how our unique and inspired curriculum can help you build the skills needed to work in these industries.

**www.DaveSchool.com**

## NOW SHOWING

TO SPEAK WITH ADMISSIONS OR TO SCHEDULE A TOUR, PLEASE **CALL (855)328-3839**
THE DAVE SCHOOL IS LOCATED ON THE BACK LOT OF **UNIVERSAL STUDIOS®** IN ORLANDO, FLORIDA

THE DAVE SCHOOL IS NOT OPERATED BY NOR AFFILIATED WITH UNIVERSAL ORLANDO®